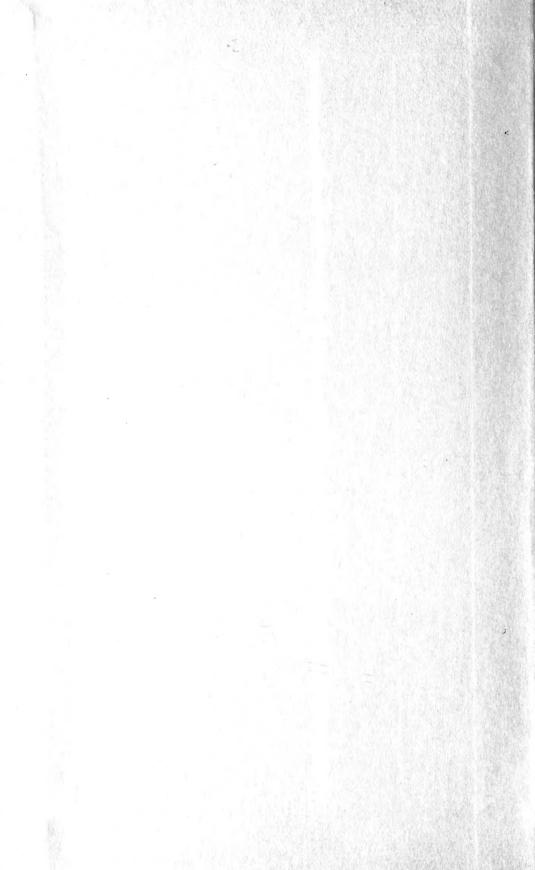
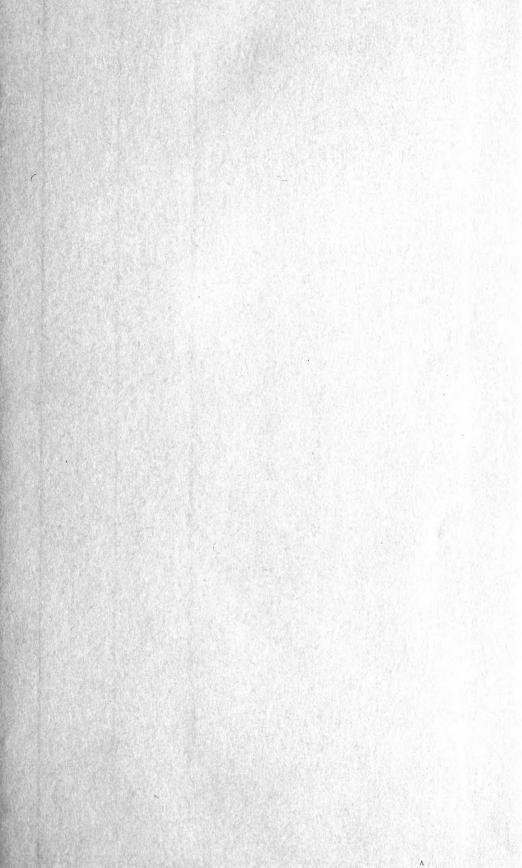
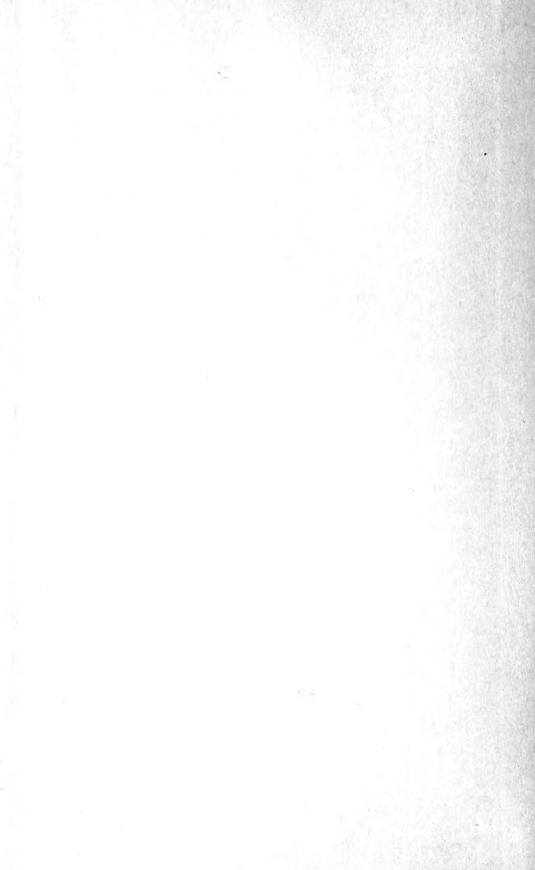
S. I. LIBRARY











Established by BENJAMIN SILLIMAN in 1818.

THE

AMERICAN

JOURNAL OF SCIENCE.

EDITOR: EDWARD S. DANA.

ASSOCIATE EDITORS

PROFESSORS GEORGE L. GOODALE, JOHN TROWBRIDGE, AND WM. M. DAVIS, OF CAMBRIDGE,

PROFESSORS A. E. VERRILL, HORACE L. WELLS, CHARLES SCHUCHERT, H. E. GREGORY, AND HORACE S. UHLER, OF NEW HAVEN,

PROFESSOR JOSEPH S. AMES, OF BALTIMORE, Mr. J. S. DILLER, OF WASHINGTON, AND REAL PROPERTY.

APR 1 = 1921

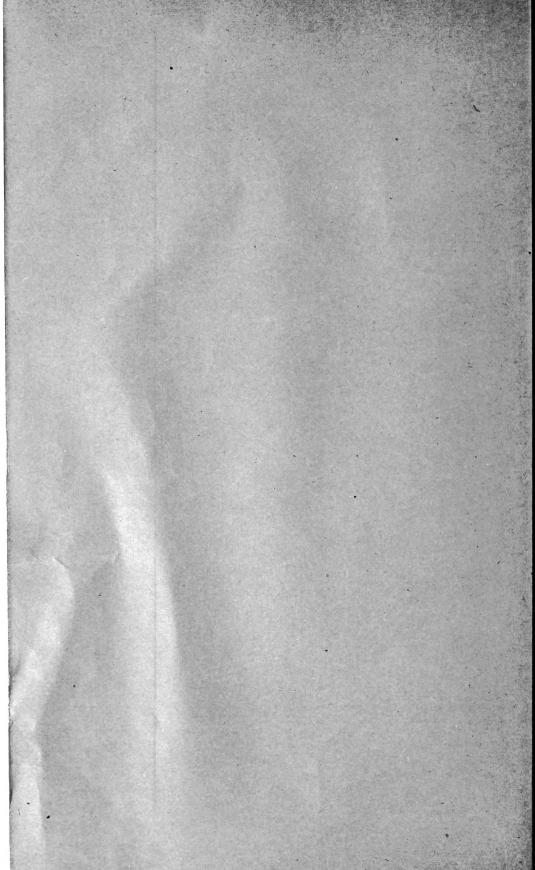
FOURTH SEAJES

VOL. L.—[WHOLE NUMBER, CC.]
INDEX TO VOLUMES XLI-L.

NEW-HAVEN, CONNECTICUT.

JANUARY, 1921.

THE TUTTLE, MOREHOUSE & TAYLOR CO., PRINTERS, 123 TEMPLE STREET.





GENERAL INDEX

OF

VOLUMES XLI-L OF THE FOURTH SERIES

In the references, heavy-faced type is used for the numbers of the volumes.

Note.—The names of minerals are inserted under the head of MINERALS; all obituary notices are referred to under OBITUARY. Under the heads BOTANY and BOTAN. WORKS, CHEMISTRY and CHEM. Works, Geology, Rocks, Zoology, the references to the topics in these departments are grouped together; in many cases the same references appear also elsewhere.

Initial capitals are in general used for the titles of books noticed.

Abajo Mts., Utah, geology, Thorpe,

48, 379. Abo Sandstone, New Mexico, Böse,

Academies, National, Hale, 41, 225. Academy of Sciences, French, 45,

- National, Meeting at Baltimore, 1918, 46, 772; Boston, 1916, 42, 506; New Haven, 1919, **48**, 402, 478; Philadelphia, 1917, **44**, 487; Princeton, 1920, **50**, 473; Wash-Princeton, 1920, 50, 473; 495; 1918, 45, 479; 1919, 47, 308, 451; 1920, 49, 387, 453, ccelerations.

Accelerations, direct

tion, Galitzin, 48, 394. Accumulator, lead, Féry, 42, 366. Achromatoscope, Williams, 41, 101.

Acoustics, lecture experiments, Kayser, 49, 446. Adelie Land, metamorphic rocks,

Stillwell, 47, 388. Adirondack Pre-Cambrian, Alling, **48**, 47.

Aeronautics, 48, 249.

Agar, W. E., Cytology, 50, 77. Agelacrinitid, from the Chazy of

New York, Clark, 50, 69. Air Propeller, Bedell, 49, 216.

- thermal conductivity, Hercus

and Laby, 47, 299. irplane Characteristics, Bedell, Airplane 46, 691.

Alabama, Hymenæa Cretaceous from, Berry 47, 65.

- geol. survey, **44,** 158.

Alaska, Paleozoic glaciation, Kirk, 46, 511.

-Pribilof Is., geological notes, Hanna, 48, 216.

Alberta, geology, Stewart, 49, 83. Alcock, F. J., Athabaska Series, 50,

Alcohol, Flint, 48, 247.

Alexander, J., Colloidal Chemistry, **48,** 160.

Alexander, P. F., Northwest and Northeast Passages, 41, 471.

Alexander, W. B., Prickly Pear, 48,

Algæ, Pre-Cambrian, etc., Twenhofel, **48,** 339.

Allan, J. A., titaniferous augite, 43, 75.

Allegheny Observatory. See Observatory.

Allen, E. T., composition of bornite, 41, 409; determination of dissociation pressures of sulphides, **43,** 175.

Allen's Commercial Organic Analysis, Davis, 44, 400.

Alling, H. L., Adirondack graphite deposits, **47**, 145; Pre-Cambrian, **48**, 47. Adirondack

Alpha particles, retardation by metals, Vennes, 44, 69.

- — from thorium, Rutherford, **41,** 561.

Alsace, potash from, Kestner, 47,

Aluminum, absorption of X-rays, Arkansas, Morrow group, Mather, Williams, **46,** 766.

Amber, Burmese, insects in, Cockerell, 42, 135.

American Journal of Science, 1818-1918, Dana, 46, 1.

American Year Book, 1916, Wickware, **43,** 496.

Ammonoids, Böse, 49, 51.

Ampère molecular currents, Einstein and de Haas, 41, 558.

Anatomy, Mammalian, Davison, 45, 151.

Anderson, W. P., Physics, 47, 229. Anderson Esker, Reeves, 50, 65. Andes of Southern Peru, Bowman,

43, 416.

Andrews, E. C., coral reefs in the Fiji Islands, 41, 135; geological history of Australian flowering plants, 42, 171; errata, 43, 174, 339.

Andros, S. O., Petroleum Hand-

book, **49**, 214. **Animal Life**, Thomson, **49**, 220.

Light, Harvey, 50, 474.Mind, Washburn, 45, 240.

- movements, etc., Loeb, 47, 81. See Zoology.

Antarctic Expedition, Brachiopoda, Thomson, 48, 397. Appalachian, Piedmont

terraces, Barrell, 49, 227, 327, 407.

Arber, A., atavism and law of irreversibility, 48, 27.

Arc lamp, cadmium vapor, Bates, 49, 378.

Archbold, M. J., Practical Electric-

ity, **43**, 249. rctic Expedition, Norwegian, Arctic 1898-1902, **50,** 169; geol., report, Holtedahl, 45, 333.

- paleogeography, Holtedahl, 49,

1, 308.

- Seas, Speerof ice, state

schneider, 43, 492. Arctowski, H., pleionian cycle of climatic fluctuations, 42, 27; mean annual temperature variation, 43, 402.

Nova Arisaig series, Silurian, Scotia, McLearn, 45, 126. Arithmetic, Klapper, 43, 333.

Arizona, Colorado Grand Canyon,

fossil footprints, Lull, 45, 337. - — Carboniferous, Schuchert, 45, Cambrian, Schuchert, 45, 347; 362.

- watering places, Bryan, 50, 188.

41, 375. etc., Pottsville formations and faunas, Mather, 43, 133.

Arldt, T., Paleogeography, 50, 238. Armitage, F. P., Chemistry, 45, 471. Arnold, J. L., Physics, 42, 436. Artiodactyls, Troxell, 49, 391; new

Tertiary, Lull, 50, 83. Ashley, R. H., Chemical Calcula-

tions, 47, 439.

Association, American, meeting at Baltimore, 1918, 47, 147; New York, 1916, 42, 507; Pittsburgh, 1917, 44, 487; St. Louis, 1919, 49, 86.

Astronomical Society, vol. II, 41, 381; vol. III, **46,** 768.

Astronomy, Moulton, 43, 170: Young, 46, 542; 47, 386. Atavism, etc., Arber, 48, 27. Athabaska Series, Alcock, 50, 25.

Atmosphere, Gases of, Ramsay, 41, 557. Atomic number and spectral series,

Bell, **47,** 227. Weights, see CHEMISTRY.
 Atoms, see CHEMISTRY.

Auditory sense, Marage, 42, 435. Audubon, the Naturalist, Herrick, 45, 150.

Aurén, T. E., absorption of X-rays, **48**, 72.

Australia, dyscrasite from, 49, 278; Great Barrier Reef, Davis, 44, fiber, 339; marine 310; 49, Prickly Pear, Alexander, 48, 475; Triassic insects, 47, 307;

Australian flowering plants, geological history, Andrews, 42, 171; **43,** 174, 339

Autoclaving, Krauss, 44, 331. Aviation, Carmina, 48, 473. Azeotropism, Lecat, 49, 217.

В

Bacteriology, Agricultural, Conn, **45**, 424

Bailey, E. H. S., Qualitative Analysis, 43, 167; Sanitary and Applied Chemistry, 44, 78.

Bailey, W. S., Mineralogy, 44, 486. Baker, C. L., stratigraphy of Eastern New Mexico, 49, 99.

Baltic Provinces, geology of, 42, 437.

Bancroft, G. R., esters from substituted aliphatic alcohols, 44, 271.

Barbour, E. H., Ligamentum teres in Nebraska Proboscidea, 41, 251; new mastodon from Nebraska, 41, 522; alkali resources of Nebraska, 43, 491; Nebraska pumicite, 44, 83.

Barker, E. H., Trigonometry, 45,

Barnett, E. DeB., Preparation of Organic Compounds, 49, 300. Barrell, J., geologic past of Central

Connecticut, 41, 148; growth of knowledge of earth structure, 46, and bearings of nature isostasy, 48, 281; status of theory of isostasy, 48, 291; Piedmont terraces of the Northern Appalachians, 49, 227, 327, 407.

- obituary notice, Schuchert, 48,

251.

Bartlett, H. H., coniferous woods of the Potomac formation, 41, 276.

Barton, E. H., Mechanics of Fluids,

41, 146.

Barus, C., interference of reversed spectra, 41, 414; rotation of interference fringes, 42, 63; spectrum interferometry, 42, 402; 43,

Bascom, F., correction of rock

analysis, 41, 300.

Bassler, H., Cycadophyte from North American Coal Measures. 42, 21.

Bassler, R. S., Index of Ordovician and Silurian Fossils, 41, 148; Cambrian, and Ordovician, of Maryland, 50, 237.

Bean, fossil sea, Venezuela, Berry, 50, 310.

Bechhold, H., Colloids in Biology, 48, 248

Becker, G. F., obituary notice, Day, 48, 242.

Bedell, F., Airplane Characteristics, 46, 691; Air Propeller, 49, 216.

Beecher's classification of trilobites, Raymond, 43, 196.

Beekeeping, Phillips, 41, 151. Beetles, fossil, Illinois, Wickham, 44, 137; Florida, Wickham, 47,

355. Benson, W. N., origin of serpentine, 46, 693.

Berea formation of Ohio, etc.,

Verwiebe, 42, 43.

Berger, W. R., Hogshooter

sand, 48, 189. Berry, E. W., palm from New Jersey Cretaceous, 41, 193; Upper Cretaceous floras, 42, 81; fossil nutmeg from Texas, 42, 241; middle Eocene members of the Sea-Drift, **43**, 298; sail fish from the Virginia Miocene, **43**, 461; obituary notice of W. B. Clark, 44, 247; fossil plants from Bolivia, 45, 78; restoration of Neocalamites, 45, 445; Cretaceous Hymenæa, from Alabama, 47, 65; age of Brandon lignite and flora, 47, 211; present tendencies in paleontology, 48, 1; evolution of plants and animals, 49, 207; lower Cretaceous of Maryland, 50, 48; floras, upper Cretaceous of Tennessee, etc., 50, 240; fossil sea bean from Venezuela, 50, 310; age of Dakota flora, 50, 387.

Best, H., The Blind, 48, 248. Beta-rays from radium, 41, 145.

Beverages and Adulterations,

Wiley, **47,** 297. Binary, system akermanite-gehlen-

ite, Ferguson and Buddington, 50, 131.

Biology, Gruenberg, 48, 477; 49, 84.

- Animal, Holmes, 47, 309; Shull, Larue and Ruthven, 50, 76.

— Civic, Hodge and Dawson, 47,

239

· Colloids in, Bullowa, 48, 248. Birds of North America, Ridgway, **12**, 86; **48**, 402.

Bishop Museum, Hawaii, Memoirs,

49, 156.

Black Hills, bibliography of geology, etc., O'Harra. 44, 158.
Blackwelder, E., geologic rôle of

phosphorus, 42, 285.
Blake, G. R., perchlorate method for determination of alkali

metals, 44, 381.

Blake, J. M., plotting crystal zones on paper, 42, 486; plotting crystal zones on the sphere, 43, 237; crystal drawing and modeling, 43, 397; solving crystal problems, 46, 651.

— obituary notice. 50, 316.

Blaney, D., Pleistocene locality on
Mt. Desert Island, 42, 399.

Blichfeldt, H. F., Finite Collinea-

tion Groups, 43, 487.

Blind, Social Survey of, Best, 48, BOTANY AND BOT. WORKS.

Block Island, Miocene bowlders, 41, 255.

Boltwood, B. B., relative activity of radium and uranium, 50, 1.

Bone, W. A., Coal, 47, 135. Book Review Index, Technical, 49,

226. Böse, E., ammonoids from New

Mexico, 49, 26. Boston basin, fossil shells

bowlder clay, Morse, 49, 157. Bosworth, T. O., Mid-Continent Oil Fields, 49, 450.

BOTANY AND BOT. WORKS.

Agricultural Bacteriology, Conn, 44, 424.

Prickly Pear, Alex-Australia, ander, 48, 475.

Australian flowering plants, geology, Andrews, 42, 171; 43, 174. 339.

Botanical Abstracts, 47, 82.

- research in Great Britain during the war, Bower, 47, 117.

Botany, Densmore, 50, 78; of Crop Plants, Robbins, 45, 242; development since 1818, Goodale, 46, 399; Fossil, Guppy, 49, 372; Fundamentals, Gager, 44, 85; General, Gager, 44, 85; Problems in, Eikenberry, 50,

Cactaceæ, Britton and Rose, 49, 222.

Cellulose, Cross and Bevan, 47,

239. Crop Production, Higher, Rus-

sell, **44**, 86.

Cyperaceæ, studies, Holm, no. XXVII, **48**, 17; XXVIII, **49**, 195; XXIX, **49**, 429.

Horticulture, Manual, Hood, 41, 381.

Plant Anatomy, Stevens, 42, 284; Culture, Goff, 42, 284; Genetics, Coulter, 47, 239; Histology, Chamberlain, 41, 380; Pathology, Harshberger, 45, 335 Products, Chemistry, Haas and Hill, 45, 242.

Plants, Anatomy of Woody, Jeffrey, 45, 152.

fossil, see GEOLOGY.

Posidonia australis, Read and Smith, 49, 310.

Prickly Pear in Australia, Alex-

ander, 48, 475.

Soil Conditions Plant and Growth, Russell, 44, 423. See also **GEOLOGY**.

Bowen, N. L., sodium-potassium nephelites, 43, 115; birefringence of torbernite, 48, 195; cacoclasite, Wakefield, Quebec, 48, 440.

Bower, F. O., botanical research

during the war, 47, 117. Bowie, W., gravity and isostasy. 43, 249; distribution of isostatic compensation, 43, 471.

Bowman, I., Andes of Southern

Peru, 43, 416. Bradley, W. M., hydrozincite, 42,

59; margarosanite, 42, 159. Brandon lignite, age, Berry, 47, 211. Branner, J. C., Geology of Brazil, 41, 302; 49, 151. Branson, E. B., Geology of Mis-

souri, 47, 78; geologic section in Missouri, 49, 267.

Brazil, favas from, Farrington, 41, 355.

- geology, Branner, 41, 302; 49, 151.

Bridgman, P. W., failure of cavities in crystals and rocks under pressure, 45, 243; stress-strain relations in crystalline cylinders, 45, 269.

British Columbia, Cyprinid from the Miocene, Hussakof, 42, 18.

British Museum of Natural History catalogues, 42, 87; publications, 44, 160, 408; 49, 388; 50,

Britton, N. L., Cactaceæ, 49, 222. Broderick, T. M., organic remains in iron-bearing Huronian rocks in Minnesota, 48, 199.

Brooklyn Institute, bulletin, 42, 87; 43, 342. Brown, G. V., selensulphur from

Hawaii, **42,** 132.

Brown, J. C., History of Chemistry, **50**, 463

Brown, W. G., apparatus for determining freezing-point lowering, 43, 110; tri-iodide and triequilibria, bromide 44, 105; ionization of cadmium iodide

solutions, 44, 453.

Browning, P. E., gallium-indium alloy, 41, 351; detection and sep-

aration of tellurium, arsenic, etc., 42, 106; separation of cæsium, etc., **42**, 279; electrolysis, etc., of gallium, **42**, 389; separation of gallium, **44**, 221; detection of germanium, 44, 313; separation of germanium, 46, 663.

Bryan, K., rock tanks and charcos,

50, 188.

Buchanan, J. Y., Observation and Reasoning, 47, 139; Oceanography, etc., 49, 217.

Bucher, W. H., ripples and related

sedimentary surface forms, 47,

149, 241.

Buckman, S. S., Brachiopoda of Burma, 50, 74. Buddington, A. F., binary system,

akermanite-gehlenite, 50, 131. Bullowa, J. G. M., Colloids in Biology, 48, 248.

Bureau of Mines, see Mines.

Burling, L. D., Albertella fauna, 42, Protichnites and Climactichnites, **44**, 387.

Burlington limestone, origin

chert, Tarr, **45**, 149. **Burton, E. F.,** Physical Properties of Colloidal Solutions, **42**, 79.

Butler salt dome, Powers, 49, 129. Butts, C., geologic section of Pennsylvania, 46, 523.

C

Cadmium vapor arc lamp, Bates,

Cady, H. P., Qualitative Analysis,

43, 167; Chemistry, 43, 247. Cæsium chloride, double double salts, Jamieson, **43**, 67.

Calcite group, crystal structures, Wyckoff, 50, 317.

Calcium carbonate, various forms of, Johnston, Merwin and Williamson, 41, 473.
- phosphate in meteoric stones,

Merrill, 43, 322. - see CHEMISTRY.

California, Tejon Eocene, Dickerson, 42, 80.

Calorimeter, new form, MacInnes and Braham, 45, 72.

Calorimetry, see Heat. Cambrian, see GEOLOGY.

Camel, Oligocene, Troxell, 43, 381.

Canada, Dept. of Mines, see Mines. - geol. survey, see Geological Reports.

Cape Town, calcium carbonate dome, Maury, 44, 369.

Carmina, B. F., Aviation, 48, 473.

Carnegie Foundation, annual reports, tenth, 42, 88; eleventh, 44, 407; twelfth, 45, 483; thirteenth, 48, 400; fourteenth, 49, 386; Bulletins, no. 8, 42, 88; no. 9, 42, 169; no. 10, 44, 407; no. 11, 46, 772; no. 12, 47, 83; no. 13, 48,

- report on preparation of

teachers, **50,** 171.

Carnegie Institution of Washington, publications, 41, 305; 42, 508; **43**, 341; **44**, 408; **45**, 483; **47**, 80, 83; **48**, 163, 401; **49**, 224, 387; 50, 473.

— Year Book, no. 14, 1915, 41, 377; no. 15, 1916, **43,** 340; no. 16, 1917, **45**, 480; no. 17, 1918, **47**, 450; no. 18, 1919, **49**, 454.

Carnotite, 41, 214.

Carrizo Mountain, Arizona, igneous geology, Emery, 42, 349. Carroll, R. S., Mastery of Nervous-

ness, 45, 241.

Case, E. C., Permo-Carboniferous red beds of No. America, 41, 219; amphibian fauna at Linton, Ohio, 44, 124; Stylemys nebracensis, 47, 435.

Catalysis, Jobling, 41, 368.
Cavities in crystals and rocks, under pressure, Bridgman, 45,

Cellulose, Cross and Bevan, 47, 239. Century of Science, 1818-1918, 46, 1

et seq.

Ceramic Society, Journal, 46, 619. Chamberlain, C. J., Plant Histology, 41, 380; Living Cycads, 47,

Chamberlain, J. S., Organic Agricultural Chemistry, 42, 165.

Chamberlin, T. C., Origin of the Earth, 42, 167, 371; mathematics

of isostasy, 49, 311. Chandler, C. F., Reminiscences, 43, 245.

Charnockite series of igneous rocks, Washington, 41, 323.

Chemical Society, Amer., Priestley Memorial, 44, 332.

CHEMICAL WORKS.

Commercial Organic Allen's Analysis, **44**, 400.

Analysis, Qualitative, Bailey and Cady, 43, 167; Fay, 47, 225; Test and McLaughlin, 48, 469.

- Quantitative, Gooch, **41**, 294; Mahin, **47**, 440; Smith, **48**, 468. - Volumetric, Knecht and Hib-

bert, 47, 226. Catalysis and Applications, Job-

ling, 41, 368. Catalytic Hydrogenation, Max-

ted, **47**, 441. Chemical Analysis, Rockwood,

41, 144. - — of Rocks, Washington, 48,

161. — — Qualitative, Scott, **48,** 70.

— of Special Steels, Johnson, 47, 297.

- Calculation Tables, Wells, 48, 161.

- Calculations, Ashley, 47, 439. - Combinations among Metals, Giua and Robinson, 46, 689.

- French, Dolt, **50,** 463.

Physiology, Cramer, 46, 549.Reactions, Falk, 50, 464. Chemie, Histoire, Delacre, 443.

Chemistry, Agricultural, Chamberlain, 42, 165; Fraps, 44, 159; Hedges and Bryant, 44, 85.

- Analytical, Muter, 44, 400; Treadwell and Hall, 42, 74; Villavecchia (Pope), 45, 329; **46**, 765.

– College, Noyes, **49,** 444. - Elementary, McPherson and Henderson, **45**, 233.

- Engineering, Stillman, 43, 166. — First Stage, Armitage, 45, 471.

— of Foods, Sherman, 46, 548. — General, Cady, 43, 247; Hale, **44,** 399.

- History of, Brown, 50, 463. - Industrial, Thorpe, 46, 61 **46**, 615, 689; 47, 135, 382; Thorp and Lewis, 42, 165.

Holleman - Inorganic, and Cooper, **43**, 80; Mellor, 46, 541; Molinari, 50, 73.

- in the Home, Weed, **45**, 471. - of Metabolism, Problems, von Fürth and Smith, 42, 442.

- in Old Philadelphia, Smith, 47, 383.

CHEMICAL WORKS.

Chemistry, Organic, Cohen, 45, 233; Noyes, 43, 81; Stoddard, 47, 135; von Richter and Spielmann, 41, 368; 48, 469.

– Physical, Lewis, **42,** 75; 160; van Klooster, **49,** 147.

- Physiological, Hawk, 42, 76; **47,** 148. – Practical, Neville and New-

man, 49, 376.

- Progress for 1915, Annual Reports, 42, 166. progress of, 1818-1918, Wells

and Foote, 46, 259. - of Proteins, Robertson, 46, 548.

- Sanitary and Applied, Bailey, **44,** 78.

 Theoretical, Getman, 46, 765;
 Nernst and Tizard, 43, 486.
 Chemists' Handbook, Liddell, 41, 558.

— — Gas, 43, 411. — Manual, Meade, 45, 416. Coal and its Uses, Bone, 47, 135.

Colloidal Chemistry, Alexander, 48, 160; Ostwald and Fischer, 41, 295; 47, 226.

Solutions, Burton, 42, 79. Colloids, in Biology, Bechhold and Bullowa, 48, 248; Physics and Chemistry, Hatschek, 41, 368; **48,** 160; **50,** 73.

Electro-Analysis, Smith, 46, 766. Electrochemical Equivalents, Hering and Getman, 44, 399.

Electrolysis in Chemical Industry, Hale, 47, 135. Food Analysis, Winton, 44, 77.

Hydrogen, Chemistry and Manufacture, Teed, 48, 470.

Laboratory Manual, Blanchard and Wade, 46, 542; McPherson and Henderson, 41, 144.

Organic Coloring Matters, Natural, Perkin and Everest, 47,

Compounds, Barnett, 49, Identification of Pure, Milliken, **42**, 166; Solubilities of, Seidell, 49, 78.

Reagents and Reactions, Tognoli, **45,** 328.

Stoichiometry, Young, 46, 689. Woodhouse, James, Chemist, 1770-1809, **46,** 541. Zinc Industry, Smith, 46, 689.

CHEMISTRY.

Acetates, tests for, Curtman and Harris, **44,** 332.

Acetylene, colorimetric determination, Weaver, 41, 463.

Acidimetry of colored solutions, Tingle, 47, 69.

Alkalimetry, yellow mercuric oxide as standard, Incze, 44, 479.

Alloys, reactive, Ashcroft, 49. 299.

Aluminium, determination, Blum, 42, 432.

Ammonia, new method for estimating, Foxwell, 42, 74.

Ammonium chloride as food for yeast, Hoffman, 43, 246.

Aqua regia, action on gold-silver alloys, 50, 315.

Argon, atomic weight, Leduc, 47, 134.

Arsenate, lead-chlor, McDonnell and Smith, 42, 139. Arsenic and Antimony, com-

pounds of, Morgan, 46, 615.

- in organic compounds, estimation, Ewins, 45, 72.

- Pearson's method, modifications of, 48, 391.

Atomic weights, report of International Committee, 49, 78; as integers when O = 16, 49, 212. Atoms, complex, Harkins, 45,

141; intermolecular transpositions, von Hevesy and Zechmeister, 50, 314; and molecules. electrons in, Langmuir, 48, 69.

Barium from brines, Skinner and Baughman, 43, 246.

- and strontium, separation, Gooch and Soderman, 46, 538. Bismuth oxychloride, solubility, Noyes, Hall and Beattie, 45, 71.

Boric acid in determination of ammonia, Scales and Harrison, 49, 443.

Cadmium iodide solutions, ionization, Van Name and Brown, 44, 453.

Cæsium chloride salts, Jamieson,

etc., separation, Browning and Spencer, 42, 279.

Calcium tartrate, crystallization, Chattaway, 42, 497.

Carbohydrates and the glucosides, Armstrong, 50, 464.

CHEMISTRY.

Carbon, activation, Chaney, 49, 212; atomic weight, Batuecas, 47, 69; detection, Mueller, 45, 73; Penfield test, Mixter and Haigh, 43, 327.

- monoxide, free, in kelp, Langdon, 43, 165.

Carbonates, alkali determination, Dubrisay, Tripier, and Toquet, **47**, 296.

Cerium, determination, and Meloche, 41, 217.

Chlorides in presence of thiocyanates, **42**, 498.

Chlorine, free, new reagent, Lo Roy, **43**, 80.

Cobalt, new volumetric method, Engle and Gustavson, 42, 431; **43**, 328.

Colloidal, Colloids. See CHEM. WORKS.

Copper and iron, determination, Edgar, 41, 462; Ley, 45, 470. Copper sulphate, basic, Young

and Stearn, 42, 497.

— test for, Lyle, Curtman and Marshall, 41, 463.

Cupferron in analysis, Lundell

and Knowles, 49, 376.

Cyanamide, preparation, Werner, 44, 478.

Dialkylphosphoric and benzenedisulphonic acids, preparation, Drushel and Felty, 43, 57.

Electrolytic analysis, Gooch and Kobayashi, 43, 391.

Esters from substituted aliphatic alcohols, Drushel and croft, **44,** 371.

Fluorine, Gautier and Clausmann, 42, 364; determination, Gooch and Kobayashi, 45, 370; in soluble fluorides, Dinwiddie, **42**, 464.

Gallium, electrolysis, etc., Browning and Uhler, 42, 389; Uhler, 43, 81; separation, Browning and Porter, 44, 221; 49, 213; from U. S. spelter, Hillebrand and Scherer, 41, 367.

Gallium-indium alloy, Browning and Uhler, 41, 351.

Gases, see Gases.

Gasoline, etc., manufacture, Rittman, Dutton and Dean, 41, 462.

Germanium, detection, Browning and Scott, 44, 313; 46, 663;

CHEMISTRY.

in zinc materials, Buchanan, **42,** 430.

Glucosane, Pictet and Castan, 50, 392.

Glycerine, new source, 47, 225; preparation by fermentation, Schweiser, 47, 381. Helium, see Helium.

Hydrocarbons, liquid, production, Fischer, 41, 557

Hydrofluoric and fluosilicic acids,

Dinwiddie, **42**, 421.

Hydrogen, desulphurizing action on coke, Powell, 50, 463; ionization, Dempster, 42, 76. - peroxide, determination, Ja-

mieson, 44, 150.

Hydrogenation, catalytic, Max-

ted, **47,** 441.

Hydrolysis of hypophosphoric acid solutions, Van Name and Huff, 45, 103.

Hypophosphates, preparation, Van Name and Huff, **46**, 587.

Indicator for bases and acids, Chauvierre, **49**, 299.

Iodides, detection, Curtman and Kaufman, 46, 614.

Iodine, action of light upon, Bor-

dier, **42,** 496.

Iron, estimation of, Edgar and Kemp, 45, 470; rotating reductors in the determination, Scott, 49, 77; spectrum, Hemsalech, 43, 413; as thiocyanate, estimation, Willstätter, 50, 392. Isotopes, see Isotopes.

Lead, atomic weight, Richards and Wadsworth, 43, 166; density of, from radioactive min-

erals, 41, 293.

- isotopes, melting points, Richards and Hall, 50, 314; isotopic, Clarke, **46**, 764; forms of, separation, Richards and Hall, 43, 409.

allotropic form. supposed

Thiel, 50, 392.

Lithium, separation from potassium, etc., Palkin, 42, 496.

Manganese, colorimetric determination, Willard and Greathouse, 44, 478; in soils, Johnson, 43, 410; electrolytic determination of, Gooch and Kobayashi, 44, 53.

Mercury, critical temperature,

CHEMISTRY.

Bender, 41, 295; determination,

Jamieson, **47**, 438.

Metals, common, qualitative separation, Clarens, 42, 364; solution in ferric salts, Van Name and Hill, 42, 301; specific heats at low temperatures, Eastman and Rodebush, 45, 327.

Molecular frequency, Allen, 46, 544; volumes, 41, 294; weights, for determining, apparatus

Chapin, 46, 613.

Molybdenum, determination, Jamieson, 43, 329. Neon, thermal conductivity, Ban-

nawitz, 41, 296. Nitrite, determination, Dienert,

47, 69; disodium, Maxted, 45,

Nitrogen, fixation, 43, 329; modification, Strutt, 42, 368.

Nitrous acid. determination, Laird and Simpson, 47, 382. Osmium, new reaction, Tschu-

gaeff, **46**, 689. Paper pulp as a filter, Jodidi and

Kellogg, 41, 557.

Paraffine, oxidation, Kelber, 50, 72.

Perchlorate method, Gooch and

Blake, 44, 381. Periodic table, Hackh, 46, 481. Permanganate solution, Halverson and Bergeim, 45, 232.

Phosphorous, etc. acids, estimation, Van Name and Huff, 45,

Photographic phenomenon, Mc-Arthur and Stewart, 49, 146.

Platinum wire in bead and flame tests, Kiplinger, **49**, 449. Potash in Alsace, Kestner,

68; cobalti-nitrite method for the determination of, Haff and Schwartz, 45, 71; from cement mills, Merz, 45, 232; from feldspar, 41, 143; from greensand, Charlton, 45, 142; from kelp, Higgins, 46, 764; from sea water, Hildebrand, 45, 231; salts in the United States, salts in the Ruhm, 50, 315; volatilization cement, Anderson and Nestell, 43, 329.

Potassium, recovery from mineral silicates, Frazer, etc., 44, 398; volumetric method, Ajon, 41, 142; iodate titrations, Ja-

CHEMISTRY.

mieson, 45, 416; nitrate, Chile, Holstein, 49, 298. Radium. See Radium.

Lind, sulphate, solubility, Underwood, etc., 45, 327. Rare Earths, Spencer, 49, 78.

Rubidium and cæsium, det mination, Robinson, 45, 142. deter-

Silicon, thermo-chemistry, Mix-

ter, 42, 125.

Silver, rate of solution in chromic acid, Van Name and Hill, 45, 54; separation from mercury, Zweigbergk, 41, 215; volu-metric method, new, Schneider, 45, 416.

Sodium peroxide, use in combustion calorimetry, Mixter, 43, 27. Soils, organic matter in, Rather, 46, 688.

Solids, diffusion of, Van strand and Dewey, 41, 216.

Stannous and lead halogen salts, Rimbach and Fleck, 41, 556. Succinic acid as a standard, Peters and Sauchelli, 41, 244.

Sucrose in acid vegetable juices, Colin, 50, 393.

dphur, sulphide, estimation, Drushel and Elston, **42**, 155; Sulphur,

liquid, Kellas, 47, 297. Sulphurous acid, preparation,

Hart, 43, 411.

Tellurium, arsenic, etc., detection and separation, Browning.

et al., 42, 106.

Thorium, emanation method for determination, Cartledge, 47, oxidimetric determination, Gooch and Kobayashi, 45, 227; separation from iron, Thornton, **42**, 151.

Tin, arsenic and antimony, separation, Welch and Weber, 42, 74; hydride, Peneth and Furth, 49, 298; and tungsten, new method of separation, Travers,

44, 479. Tri-iodide and tri-bromide equilibria, Van Name and Brown, 44, 105.

Tungsten, occurrence, Runner and Hartmann, 47, 225.

Uranium, Chemistry, Pierlé, 49,

- dioxide, preparation, Parsons, **43**, 485.

Vanadic acid.

CHEMISTRY.

Gooch and Scott, 46, 427; Edgar, **42**, 365.

Vanadium, determination, Turner, 41, 339; 42, 109; in sedimentary rocks, Phillips, 46, 473.

Vapors in gases, estimation of, H. S. and M. D. Davis, 46, 688. Weighing, analytical, Wells, 49,

375; deflection method of, Brinton, **48**, 390.

Yttrium. separation, Bonardi and James, 41, 142.

determination, Jamieson, 46, 614; Howden, 47, 70.

Zirconium, determination, Lundell and Knowles, 48, 67;

Smith and James, 50, 393. Chert, origin, Tarr, 44, 409; 149; Van Tuyl, 45, 449.

California, Davis, 47, 234; Kansas, Twenhofel, 47, 407; Missouri, formation, Dean, 45, 411. Cincinnati, geology, Fenneman, 43,

Clark, A. H., Existing Crinoids, 41,

Clark, B. M., Introduction to Science, 45, 420; Laboratory Manual,

Clark, T. H., Agelacrinitid, from Chazy of New York, 50, 69. Clarke, F. W., Data of Geochemis-

try, 41, 376; constitution of melilite and gehlenite, 43, 476.

Clay, dolomitic, Ries, 44, 316. Cleland, H. F., Geology, 42, 282. Climatic Control, Humphreys, 49, 305; fluctuations, pleionian cycle of, Arctowski, 42, 27. Coal beds in West Virginia, Hen-

nen, **46,** 770.

Coal Industry, 42, 503; and Uses, Bone, 47, 135; water content, genesis and nature, Mack and Hulett, 43, 89; and Smyth, 45, 174; origin of brown, Stevenson, 43, 211.

Coast Survey, United States, annual report, 1915, 41, 305; 1916, **43,** 253; 1918, **47,** 309; 1919, **49,** 309.

- Centennial celebration, 42,

505. - — Magnetic chart, **41,** 466. - — degree awarded to

Bowie, 48, 249.

determination.

Cockerell, T. D. A., insects in Bur-

fossil parasitic hymenoptera, 47, 376.

Coe, W. R., a century of zoology in America, 46, 355; notice of R. Rathbun, 46, 757. Cohen, J. B., Organic Chemistry,

45, 233.

Coleman, A. P., wave work as a measure of time, 44, 351, 487.

Collineation Groups, Finite, Blich-

feldt, 43, 487. Colloidal, Colloids. WORKS. See CHEM. Vision, theory, Houstonn, Color

42, 433. Colorado age of Scranton coal,

Richardson, 43, 243.

- fossil footprints from the Grand Canyon, Lull, 45, 337; Carboniferous, Schuchert, 45, 347; Cambrian, 45, 362.

Geology of the Raton Mesa, Lee and Knowlton, 47, 74, 142.

— mineral springs, radioactive properties, Lester, 46, 621.

- Raton Mesa, geology, Lee and Knowlton, 47, 74, 142.

Coloring Matters, Natural Organic, Perkin and Everest, 47, 382.

Comstock, D. F., Matter and Electricity, 43, 414.

Congress, Library of. See Library. Coniferous woods, Potomac, formation, Sinnott and Bartlett, 41, 276.

Conn, H. W., Agricultural Bacteriology, **45**, 424.

Connecticut, central, in the geologic past, Barrell, 41, 148.

geol. survey. See GEOL. RE-PORTS.

- insects of, Viereck, etc., 44, 83; marine terraces, Hatch, 44, 319; Valley, Triassic life, Lull, 41, 147.

Continental fracturing, Oceanica,

Schuchert, 42, 91.

Coral reef problem and Funafuti borings, Skeats, 45, 81; the formation of dolomite, Skeats, 45, 185; and isostasy, Molengraaff, 44, 153.

- see Davis, W. M.

- zone and the glacial period, Daly, **48,** 136.

- reefs, in the Fijis, Andrews, 41, 135.

- and coral islands, Murray Is., **47,** 80.

mese amber, 42, 135; 44, 360; Corona, influence of a series spark on, Crooker, 45, 281.

Cosmogony, Jeans, 49, 150. Cotton, C. A., block mountains in New Zealand, 44, 249; 45, 149. Coulter, J. M., and M. C., Plant Genetics, 44, 239.

Cramer, W., Chemical Physiology. **46**, 549.

Crehore, A. C., Matter and Energy, 45, 76.

Cretaceous, lower, in Maryland,

Berry, 50, 48. Crew, H., Physics, 42, 50. Crooker, S. J., influence of a series spark on the direct current corona, 45, 281.
Crooks, H. F., Early Silurian rocks

of No. Michigan, 45, 59.

Crops, Manuring for, Russell, 44, 86.

Cross, C. F., Cellulose, 47, 239. Cross, W., obituary notice of Louis

V. Pirsson, 50, 173.
Crowther, J. A., Life of Faraday, 47, 230; Molecular Physics, 48, Ions, Electrons, etc., 49, 473; 381.

Crustacea, Paleozoic, Vogdes, 44, 336.

Crystal drawing and modeling, Blake, 43, 397; optics, use of graduated sphere, Warren, 42, 493; problems, Blake, 46, 651; structure, Whitlock, 49, 259; of calcite group, Wyckoff, 50, 317; zones, plotting, Blake, 42, 486; 43, 237.

Crystallography and Mineralogy, new journal, Goldschmidt, 50, 398.

Crystalline cylinders, stress-strain relations in, Bridgman, 45, 269.

Crystals, growth under external pressure, Taber, 41, 532; method of growing large, Moore, 48, 391; salt, formation, Long, 43, 289. Cunningham, E., Relativity and the

Electron Theory, 41, 297. Cushny, A. R., Secretion of Urine,

44, 159. Cutbush, James, Amer. Chemist,

1788-1823, Smith, 49, 79. Cuttingsville, Vt., eruptive rocks.

Eggleston, 45, 377.

Cuzco, Peru, geology, Gregory, 41, 1; Indians of, Ferris, 43, 339. Cycadophyte, classification, Wieland, 47, 391; from No. Amer. Coal Measures, Bassler, 42, 21. Cycads, Amer. Fossil, Wieland, 43, | Delacre, M., Histoire de la Chemie, 333; 46, 645; 47, 391.

Living, Chamberlain, 47, 449. Cylinders of scoriaceous diabase,

Emerson, 41, 321.

Cyperaceæ, studies, No. XXVII, Holm, 48, 17; no. XXVIII, 49, 195; no. XXIX, 49, 429; no. XXX, 50, 159. — see BOTANY.

Cytology, Agar, 50, 77.

Dakota flora, age, Berry, 50, 387. Dale, T. N., Algonkian Cambrian boundary in Vermont, 42, 120; unconformity of Berkshire schist and Stockbridge limestone, 49, 369.

Dall, W. H., Bivalve Mollusks of the west coast of America, 42,

Daly, R. A., problems of the Pacific Islands, 41, 153; geology of Pigeon Point, Minnesota, 43, 423; coral-reef zone and glacial

period, 48, 136. Dana, E. S., American Journal of

Science, 1818-1918, 46, 1.

Darton, N. H., geology of Luna County, New Mexico, 42, 82; Grand Canyon, 44, 158.

Daugherty, L. S. and M. C., Economic Zoology, 45, 335.

Davies, A. M., Paleontology, 50, 467.

Davis, M. M., Jr., Dispensaries, 46, 771.

Davis, W. A., Allen's Commercial Organic Analysis, 44, 400.

Davis, W. M., Great Barrier Reef of Australia, 44, 339; Geological Handbook of Northern France, 45, 479; Cedar Mt. trap ridge near Hartford, 46, 476; notice of, G. K. Gilbert, 46, 669; framework of the earth, 48, 225.

Davison, A., Mammalian Anatomy, 45, 151.

Day, A. L., obituary notice of G. F.

Becker, 48, 242. Dayton, Ohio, geology, Foerste, 41,

Dean, R. S., formation of Missouri cherts, 45, 411; electron theory of passivity, 47, 123; Physical Chemistry of Metals, 49, 147. 49, 443.

De Moraes, L. F., ferrazite, 48, 353. Density of solids, Le Chatelier and Bogitch, 43, 79; balance for solids, Gasnault, 47, 72.

Densmore, H. D., Botany, 50, 78. Devonian of Central Missouri, Greger, **50**, 20.

Diamond, dispersion, Silberstein, 47, 441.

Diamonds, in 1919, 50, 472.

Diastrophism in the Atlantic-Arctic region, Holtedahl, 49, I; in Northeastern America, Schuchert, **50**, 399; in Oceanica, Schuchert, 42, 91.

Diatoms, fossil, from Pribilof Islands, Hanna, 48, 216.

Diffusion and rhythmic precipita-

tion, Stansfield, 43, 1. Dighton conglomerate, Perkins, **49,** 61.

Diller, J. S., notice of Arnold Hague, 44, 73.

Dinosaurs, functions of the "sacral" brain in, Lull, **44,** 471. See **GEOLOGY**.

Dinwiddie, J. G., hydrofluoric and fluosilicic acids, 42, 421; fluorine in soluble fluorides, 42, 464. Dispensaries, Davis and Warner,

46, 771.

Dissociation pressures, determination, Allen and Lombard, 43, 175. Dolomite formation and the coral reef problem, Skeats, 45, 81, 185;

origin, VanTuyl, 42, 249. Dolt, M. L., Chemical French, 45, 417; 50, 463. Downing, E. R., Biological Nature

Study, 48, 162. Drops and vortices, forms assumed

by, Hatschek, 47, 383.

Drushel, W. A., sulphide sulphur, 42, 155; dialkylphosphoric acids, etc., 43, 57; esters from substituted aliphatic alcohols, 44, 371.

Dryer, C. R., Economic Geography, **45**, 484.

Duckworth, W. L. H., Morphology and Anthropology, 41, 564.

Duclaux, E., Pasteur, 50, 80.

Duff, A. W., Physics, 42, 437.

Dunbar, C. O., Rensselærina, 43,

467; Devonian of West Tennessee, 46, 732.

Duparc, L., Russian studies, 49, 451. Dustfall of March 9, 1918, Winchell and Miller, 46, 599; 47, 133.

Earth, Evolution of, Barrell, Schuchert, etc., 46, 770; The Face of, Suess, 47, 235; framework of, Davis, 48, 225; Origin, Chamberlin, 42, 167, 371. Earthquake, of 1918 in Porto Rico,

50, 236.

- investigation Committee, Japanese, **42**, 84.

East, E. M., Inbreeding and Outbreeding, 49, 385. Eaton, G. F., Osteological Material

from Machu Picchu, 42, 86, 281. Edinburgh, Mathematical Tracts. Whittaker, 41, 226, 298.

Education Board, General, report,

42, 89.

Public, in Maryland, 42, 88.

Eggleston, J. W., Eruptive rocks at Cuttingsville, Vermont, 377.

Ehlers, G. M., Heterolasma foerstei from Michigan Niagaran, 48, 461. Eikenberry, W. L., Botany, 50, 78.

Einstein, A., Relativity, 50, 465. displacement of solar lines,

Grebe and Bachem, 50, 394. Electric and Magnetic Measurements, Smith, 43, 415.

- discharges in gases. Strutt, 45,

- Oscillations and Electric Waves, Pierce, **49**, 303.

- resolution of helium lines, Merton, 47, 385.

Electricity, Pidduck, 42, 79.

Emission from Hot Bodies, Richardson, 42, 369.

Practical, Archbold, 43, 249. Electro-Analysis, Smith, 46, 766. Electrochemical equivalents, Hering and Getman, 44, 399.

Electrodes, perforated, experiments with, Aston, 49, 301.

Electrolysis in Chemical Industry, Hale, 47, 135.

Electrolytic Analysis, Gooch and Kobayashi, 43, 391.

Electromagnetism, Oersted's discovery, 1820, Larsen, 50, 466.

Electron, Millikan, 44, 333.

- theory of passivity, Dean, 47, 123; and relativity, Cunningham. 41, 297.

Electrons, in atoms and molecules, Langmuir, 48, 69; motio through gases, Wellisch, 44, 1. motion Electroscopes, emanation, Lester, 44, 225.

Electro-titration, Robbins, 41, 246. Elston, C. M., sulphide sulphur, 42, 155.

Embryological Essays, Assheton, 43, 421.

Embryology, Lillie and Moore, 49, 222; Human, McMurrich, 41, 225. Emerald deposits of Muzo, Colom-

bia, Pogue, 42, 85. Emerson, B. K., cylinders of scoriaceous diabase, 41, 321; minera-

logical notes, 42, 233.

Emery, W. B., igneous geology of Carrizo Mountain, Arizona, 42, 349; Green River desert section, Utah, 46, 551. Energy, Theories of, Perry, 45, 419.

Engineering Education, Mann, 46,

Engineers Tables, Ferris, 43, 342. Entelodonts of Marsh Collection, Troxell, 50, 243, 361, 431.

Entomology, Lochhead, 47, 453. Epsomite, spotted lakes of, Jen-kins, 46, 638.

Equidæ of North America, Osborn, 46, 770.

Equilibrium and Vertigo, Jones, 48, 79.

Errors and Least Squares, Theory of, Weld, 41, 562. Erwin, M., Universe and the Atom,

41, 369.

Etchings, beryl, Honess, 43, 223; calcite, etc., Honess, 45, 201. Ethnology, Amer. Bureau, 47, 452.

Europe, submergence, Schuchert,

Evolution, Cosmical, McLennan, 43, 169; of earth, Barrell, Schuchert, etc., 46, 770; of Life, Osborn, 45, 77; Meaning, Schmucker, 41, 151; in medicine, Adami, 46, 691; of plants and animals, Berry, 49, 207; Theory, Scott, 44, 84.

F

Fabry, Ch., note on paper by, Uhler, 49, 143, 148. Falk, K. G., Chemical Reactions,

50, 464. Faraday, Michael, Life of, Crow-

ther, 47, 230.

Farlow, W. G., obituary notice. Thaxter, 49, 87. Farrington, O. C., Brazilian favas,

41, 355; Characters of Meteorites, 41, 376; Catalogue of North American Meteorites, 41, 223; goyazite, 43, 420. Fauna. See GEOLOGY. Favas, Brazilian, Farrington, 41,

Fay, H., Quantitative Analysis, 47,

Felidæ, Oligocene, Thorpe, 50, 207. Felty, A. R., dialkylphosphoric acids, etc., 43, 57.

Fenton, C. L., Devonian of Iowa, 48, 355.

Ferguson, H. G., tin deposits, Irish Creek, Virginia, 45, 477.

Ferguson, J. B., melting points of cristobalite and tridymite, 46, 417; ternary system, CaO-MgO-SiO₂, 48, 81; wollastonite and the ternary system, 48, 165; binary system akermanite-gehlenite, 50,

Ferric oxides, hydrated, Posnjak and Merwin, 47, 311.

Ferris, C. E., Tables for Engineers, 47, 309.

Ferris, H. B., Cuzco Indians, 43, 339. Ferry, E. S., Physics Measure-

ments, 47, 138.

Fertilization, Lillie, 48, 162.

Field, R. M., Middle Ordovician of Pennsylvania, 48, 403.

Field Museum of Natural History, 1915, 43, 88; 1916, 44, 160; 1917,

46, 479; 1918, 47, 451. Fiji Islands, coral reefs, Andrews, 41, 135; Geology, Foye, 43, 343; 47, 387.

Filters, paper pulp for, 41, 557. Finch, J. K., Topographic maps,

50, 236. Finkelstein, L., radioactivity of

meteorites, 44, 237. Finmarken, Paleozoic formations,

Holtedahl, 47, 79, 85. ish, Sail, from the Miocene, Berry, 43, 461. Virginia Fish,

Flame tests, Kiplinger, 49, 442.
Flames, Colored, of high luminosity, Hemsalech, 44, 482.
Flint, G. E., Whole Truth About Alcohol, 48, 247.

Flora. See GEOLOGY.

Comanchean formation, Sellards, 48, 13; Vero, fossil beetles, Wickham, 47, 355; discovery of fossil human remains, Sellards, 42, 1; 47, 358; geol. survey, 43, 85; phosphate deposits, Sellards, 41, 299; Matson, 41, 300.

Florissant beds, Coleoptera from, Wickham, 42, 81.

Fluids, mechanics of, Barton, 41,

Fluorescent screens for radioscopic purposes, Roubertie and Nemi-

rovsky, 48, 392. Foerste, A. F., American Ordovi-

cian Lichadidæ, 49, 26. Food Analysis, Winton, 44, 77. — and Drug Laboratories, Meth-

ods in, Schneider, 41, 381.
Foods, Microbiology, Schneider, 50, 172; Poisoning, Jordan, 44, 158.

Foote, H. W., progress of chemistry, 1818-1918, 46, 259.
Footprints, Grand Canyon, Ari-

zona, Lull, 45, 337; Massachusetts Carboniferous, Lull, 50, 234; Pennsylvanian of Oklahoma, Jillson, 44, 56; Glen Rose limestone, Texas, Shuler, 44, 294. Ford, W. E., hydrozincite, 42, 59;

margarosanite, 42, 159; apatite from Auburn, Me., 44, 245; growth of mineralogy, 1818-1918, 46, 240.

- new mineral names, 42, 504; **43**, 493; **44**, 485; **45**, 477; **47**, 446. Formkohle, origin, Stevenson, 43, 211.

Fort, C., Book of the Damned, 49, 304.

Foshag, W. F., sulphohalite, 76; apthitalite (glaserite), California, 49, 367. Fossil. See GEOLOGY.

Fossilium Catalogus, 41, 222, 223. Foye, W. G., geology of the Lau Islands, Fiji, 43, 343; 47, 387.

France, Science and Learning, 44,

Franklin, W. S., Physics, 43, 168. Fraps, G. S., Agricultural Chemistry, 44, 159.

Freezing-point lowering, determination, Van Name and Brown, 43, IIO.

French, Chemical, Dolt, 45, 417. Fringes, interference, rotation, Barus, **42**, 63.

Funafuti borings, Skeats, 45, 81. Fundy, Bay of, marine faunas, Kindle, **41**, 449.

Gager, C. S., Botany, 44, 85. Gale, H. G., Physics, 50, 394. Gallium. See CHEMISTRY. Galloway, J. J., rounding of sand

by solution, 47, 270.

Gas Chemists' Handbook, 43, 411. - field, Hogshooter, Berger, 48, 189.

 molecules, condensation, Wood, 43, 81.

Gases, of Atmosphere, Ramsay, 41, 557; diffusion of light by, Fabry, 47, 70; magnetic susceptibilities, Honda and Okubo, 49, 377; polarization, Strutt, 47, 137; and vapors, electric discharges, discharges,

Strutt, 45, 234. Gaskell, W. H., Involuntary Nerv-

ous System, 42, 87.

Gems, Kunz, 47, 238; Schaller, 47, 145; Sterrett, 41, 223.

Genetics, Pearl, 41, 379. Geochemistry, Data of, Clarke, 41,

Geodes of the Keokuk beds, Van Tuyl, 42, 34.

Geografiska Annaler, 49, 86. Geographical Society, Transcontinental Excursion of 1912, 41, 304. Geography, Economic, Dryer, 45, 484.

Geologic instruction, Gregory, 47, 281; Map of Ohio, Bownocker, 50, 239; Handbook of Northern France, Davis, 45, 479.

GEOLOGICAL REPORTS.

Alabama, **44,** 158.

Canada, annual report, 1914, 41, 467; 1915, 42, 84; 1916, 46, 477; publications, 44, 81; 46, 477, 547.

Connecticut, bulletin, no. 22, 44, 83; 8th biennial report, 47, 390. Florida, 8th annual report, 43, 85. Illinois, bulletins, no. 33, 43, 490; no. 37, 49, 383; no. 39, 48, 78; no. 40, 49, 383; Year-book. no. 40, **49,** 383; 1910, **41,** 564. Iowa, annual report, 1914, **43,**

1915, 45, 421; bulletin, no. 6, 48, 77.

Kentucky, 41, 374; 47, 232. Maryland, 46, 768; 50, 237. Minnesota, 49, 383. Mississippi, 41, 375.

Missouri, Branson, 47, 78.

Nebraska, 43, 491.

GEOLOGICAL REPORTS.

ew Zealand, annual reports, 10th, 43, 335; 11th, 45, 423; New bulletins, no. 17, 41, 565; no. 17, 41, 565; no. 18, 45, 148; no. 22, 50, 76; paleontological bulletin no. 4, 45, 77

North Carolina, 48, 78. South Africa, 41, 564; 45, 146. South Australia, annual report,

1915, **43,** 492; 1916, **45,** 422; bulletins, no. 6, **45,** 147; no. 7, **49**, 384.

Texas, 41, 373.
United States, 36th annual report, 41, 371; list of publications, 41, 371; 42, 440.

- — 37th annual report, **43,** 488; lists of publications, 43, 418,

489; **44,** 405.

— 38th annual report, **45**, 421; lists of publications, 45, 475.

- — 39th annual report, **47,** 140; lists of publications, 47, 141; 48, 75, 161, 476.

— 40th annual report, **49**, 448; list of publications, 49, 448; 50, 469.

Vermont, 43, 490.

Virginia, biennial report, 1914-1915, **42**, 82; bulletin no. 14, 45, 476; no. 15a, 45, 477; no. 17, 49, 153; no. 18, 48, 77; no.

19, **49,** 153. West Virginia County reports, **41,** 373; **42,** 503; **43,** 419; **45,** 79; **46,** 769; **49,** 153.

Western Australia, annual report, 1915, **43**, 252; 1918, **50**, 76; bulletins, nos. 58, 62, 64, 65, 41, 566; no. 63, 43, 336; nos. 71, 73-76, 48, 474; no. 77, 50, 76.

Wisconsin, bulletins, no. 42, 41, 374; nos. 28-32, 37-40, no. 35, no. 40, 41, 467; no. 36, 42, 83; no. 47, 48, 78.

Geological Society of London, 45,

478.

Surveys, History ofAmer. U. S. State, Merrill, 50, 395; Government, 1818-1918, Smith, 46, 171.

Geologie, Handbuch der Regiona-

len, 41, 302; 50, 396.

Geology, Economic, Ries, 43, 252, 339; Field, Lahee, 43, 172; Historical, Miller, 43, 87.

— history, 1818-1918, Schuchert,

46, 45; Gregory, **46**, 104; Barrell, | **GEOLOGY**.

46, 133; Lull, 46, 193. Geology, Physical, Cleland, 42, 282; Pirsson, 50, 460. - Review of, 48, 247.

GEOLOGY.

Abo sandstone, New Mexico, ammonoids, Böse, 49, 26. Agelacrinitid, from New

Chazy, Clark, 50, 69.

Burling, fauna, Albertella 469.

Aletomeryx, Lull, 50, 83. Algal deposits. Pre-Cambrian, etc., Twenhofel, 48, 339.

Algonkian Cambrian boundary in Vermont, Dale, 42, 120. Ammonites, American Jurassic.

Reeside, 50, 240.
- Type, Buckman and Tutcher,

50, 468. Ammonoids from New Mexico, Böse, 49, 26; Lee, 49, 323; of

Texas, Böse, 47, 305. Amphibia, Coal Measures North America, Moodie,

Amphibian, Eocene, Loomis, 47, 217.

Arcas, Atlantic Slope, Sheldon, 43, 251.

Arthropods in Burmese amber, Cockerell, 44, 360. Artiodactyl, Oligocene, Troxell, 49, 391; Tertiary, Lull, 50, 83. Athabaska Series. Alcock, 50, 25. Barrier Reef of Australia, Davis. 44, 339.

Beatricea, fossil hydroid, Schuchert, 47, 293.

Berea formation of Ohio, etc., Verwiebe, **42**, 43.

Berkshire schist and Stockbridge limestone, unconformity, Dale, 49, 369.

Botany, fossil, in the Western World, Guppy, 49, 372.

Norway, Brachiopod shales,

Troedsson, 48, 78. Brachiopoda of Antarctic Expedition, Thomson, 48, 397; of Burma, Buckman, 50, 74; of the Girvan District, Reed, 43, Permian, of Armenia, Stoyanow, 42, 439; recent, U. S. Nat. Museum, Dall, 50, 170.

Bryozoa, early Tertiary, and Bassler, 50, 241; fossil, West Indies, Canu and Bassler, 49, 83.

Burlington limestone, origin of

chert, Tarr, 44, 409. Butler salt dome, Texas, Powers,

49, 127. Cambrian, Algæ and Spongiæ, Walcott, 50, 239; geology, Walcott, 42, 439; of the Grand Canyon, Schuchert, 45, 362; and Ordovician of Maryland, Bassler, 50, 237; and Pre-Cambrian formations, Montana, Walcott, 42, 372; trails, critical study, Burling, 44, 387; Trilobites, Walcott, 41, 301. Carboniferous footprints, Mass.,

Lull, 50, 234; of the Grand Canyon, Schuchert, 45, 347.

Cedar Mt. trap ridge near Hartford, Davis, 46, 476.

Champlain submergence Maine coast, Meserve, 48, 207. Chapman sandstone of Maine,

fauna, Williams, **42,** 169. Cheilostome Bryozoa, Canu and Bassler, **43,** 419.

Cheirurinæ, revision, Barton, 41,

Cherts, California, Davis, 47, 234; Kansas, Twenhofel, 47, 407; Missouri, formation of, Dean, **45**, 411; origin, Tarr, **44**, 409; **45**, 149; Van Tuyl, **45**, 449; radiolarian, in Oregon, Smith, **42,** 299, 504.

Chester series, Kentucky, 47, 232. Chilopods and trilobites, ancestry, Tothill, 42, 373.

Cincinnatian fossils, Foerste, 43, 493.

Coleoptera, new, from the Florissant beds, Wickham, 42, 81.

Comanchean of Florida, Sellards, 48, 13; Kansas, Twenhofel, 49, 281; Texas, Adkins and Minton, 50, 241.

Conglomerates, origin, Field, 43, 85.

Continental fracturing in Oceanica, Schuchert, 42, 91.

Cooper limestone, Greger, 50, 20. Coral-reef. See Coral Reef.

Crab, fossil, Mary J. Rathbun, 41, 344.

GEOLOGY.

Cretaceous age of the "Miocene flora" of Sakhalin, Kryshtofovich, **46**, 502.

New Zealand, - faunas of

Woods, 45, 78.

- limestones underlying Florida, Cushman, 47, 307.

— lower, Federal Hill,

Maryland, Berry, 50, 48.

— Tertiary boundary in S America, Windhausen, 45, I. So.

- upper, floras of Tennessee, etc., Berry, 50, 240; of the world, Berry, 42, 81; Fulgur, Wade, 43, 293. Crustacea, Paleozoic, Vogdes, 44,

Crustaceans, decapod, from Panama, Rathbun, 47, 234.

Cycadophyta, Wieland, 47, 391. Cycadophyte from North American Coal Measures, Bassler, 42, 21.

Cycads. See Cycads.

Cyprinid fish, British Columbia, Hussakof, 42, 18.

Dakota flora, age, Berry, 50, 387. Devonian faunas of MacKenzie

River Valley, Kindle, 42, 246.

— shales of Ohio and Pennsylvania, correlation, Verwiebe,

44, 33.

- of Central Missouri, Greger, 49, 265; Illinois, Savage, 49, 169; Iowa, Hackberry stage, Fenton, 48, 355; Missouri, Missouri, 20; Montana, Greger, 50, fauna, Haynes, 41, 375; Southwest Ontario, Stauffer, 41, 221; West Tennessee, Dunbar, 46, 732; **49**, 307.

Diceratheres, American, Peter-

son, **50,** 396. Dighton conglomerate, Perkins,

49, 61. Dinosaur, Sauropodous, diseased

vertebræ, Moodie, 41, 529. - tracks at Glen Rose, Texas, Shuler, 44, 294; see Footprints.

Dinosauria, Armored, of U. S., Nat. Museum, Gilmore, 47, 236. Dinosaurs, functions of "sacral"

brain, Lull, 44, 471.

- see Marsh Collections. Echinodermata of the U. S., Clark and Twitchell, 41, 221.

Echinoidea of the Buda limestone, Whitney, 42, 440; Cre-

GEOLOGY.

taceous and Cenozoic, of the Pacific Coast, Kew, 50, 468. Edgewood limestone of Pike Co.,

Missouri, Rowley, 41, 317. Entelodonts, Troxell, 50,

361, 431.

Eocene insects from the Rocky

Mts., Cockerell, **50**, 169.

- Lower, floras of southeastern North America, Berry, **42**, 438. - of the Mississippi embayment,

Berry, **41,** 222. – Tejon, of California, Dickerson, **42**, 80.

Equidæ, Osborn, 46, 770.

Esker, Anderson, Reeves, 50, 65. Eusthenopteron, Bryant, 50, 240. Exogyra in the Texas Cretaceous, Böse, 49, 84.

Fauna, amphibian, at Linton. Ohio, Case, 44, 124; of Chapman sandstone, Williams, 42, man sandstone, Williams, 42, 169; Lower Cambrian, Holmia, Norway, Kiær, 44, 336; Tertiary, of Pacific coast, 45, 332.

Fish, Cyprinid from Miocene of British Columbia, Hussakof. 42, 18; Palæoniscid from So. Dakota, Hussakoff, 41, 347.

Fish-remains, Cretaceous Tertiary, New Zealand, 48, 475. Flora, Liassic, of the Mixteca Alta, Wieland, 42, 370; of the Morrison formation, Knowlton, **49,** 189.

Floras, Upper Cretaceous, of the World, Berry, 42, 81.

Fossil bean, Venezuela, Berry, **50,** 310.

- Floras of middle Eocene, Georgia, Berry, **43**, 298.

- footprints from the Grand

Canyon, Lull, 45, 337.

- fuels, interrelations, Stevenson, 42, 439.

- human remains, discovery in Florida, Sellards, 42, 1; 47, 358.

- hydrozoan, from Japan, Hayasaka, **44,** 338. - shells in Boston basin, Morse,

49, 157.

Fossils, American, Index to. Bassler, **41,** 148. – from Miura,

Japan, Yokoyama, 50, 241.

Fulgur, Upper Cretaceous, Wade, 43, 293.

GEOLOGY.

Tennessee, Wade, Gastropoda, 45, 78, 334.

Geologic section of Pennsylvania, Butts, **46**, 523. laciation. See **Glaciation**.

Glaciation.

Glaciers. See Glaciers.

River desert section, Green

Utah, Emery, 46, 551. Hackberry stage of the Devonian of Iowa, Fenton, 48, 355.

Headwaters divide of Right Middle Creek, Kentucky, Jillson, 47, 60.

Heterolasma foersti from Michigan, Ehlers, 48, 461.

Hillsboro sandstone, stratigraphic position, Prosser, 41, 435.

Homalonotus, Reed, 46, 771.

Hymenæa, Cretaceous from Alabama, Berry, 47, 65.

Hymenoptera, fossil parasitic, Cockerell, 47, 376. Hypisodus alacer, Troxell, 49,

Insects, ancestry of, Tothill, 42, 373; in Burmese amber, Cockerell, 42, 135, 44, 360; from Coal Measures of France, Bolton, 45,

78; Eocene, Cockerell, 50, 169. Triassic, of Australia, 47, 307. Isopod, fossil, Chilton, 47, 307.

Isostasy. See Isostasy. Jurassic, American, ammonites, Reeside, 50, 240; Fauna, Cuba, Roig, 50, 237.

Keokuk beds, geodes of, Van

Tuyl, 42, 34.

Labyrinthodont, new, Pennsylvania Triassic, Sinclair, 43, 319. Lava. See Lava.

Lichads, Amer. Ordovician, generic relations, Foerste, 49, 26. Ligamentum teres in Nebraska

Proboscidea, Barbour, 41, 251. Lignite, age of Brandon, Berry, 47, 211.

Limestone, Niagara, Rochester, brecciation in, Giles, 47, 349. Lopolith, Grout, 46, 516.

Manzano group, New Mexico, Lee, 49, 323.

Marine faunas, bottom control, Kindle, 41, 449; invertebrates, analysis, Clarke and Wheeler, 43, 419.

Mastodon, So. Carolina, Loomis,

45, 438.

GEOLOGY.

Mesozoic physiography of Rocky Mts., Lee, 47, 78.

Miocene bowlders, fossiliferous, Block Island, Shimer, 41, 255. Mississippian of Kentucky, Butts,

47, 232; of Ohio, etc., correlation of, Verwiebe; 43, 301.
Mollusks, Bivalve, of the North-

west Coast of America, Dall, **42,** 439.

Morrison formation, Mook, 43, 85; Colorado, Knowlton, 49, 189; Lee, 49, 183.

Morrow group of Arkansas fauna, Mather, 41, 375.

Mountains, block, in New Zealand, Cotton, **44**, 249; **45**, 149. Mysticocrinus, Springer, **46**, 666. Naiades of Pennsylvania, Ortmann, 50, 242.

Neocalamites, Berry, 45, 445. Neocomian of Argentina, Wind-

hausen, 47, 303. Neogene deposits in Venetia, Stefanini, **44**, 299.

from Nutmeg, fossil, Berry, 42, 241.

Oligocene camel, Troxell, 43, 381; of Chehalis Valley, paleontology, Van Winkle, 45, 334; Felidæ, Thorpe, 50, 207.

Onaping map area, Collins, 46, 547.

Ordovician, Indiana, McEwan, 50, 154. -

- Lichads, generic relations, Foerste, **49**, 26.

- Middle of Pennsylvania, Field, **48**, 403.

- strata of the Baltic basin, Raymond, **42**, 437.

- Upper, formations in Canada,

Foerste, **42**, 438.

 and Silurian brachiopods, Girvan district, Reed, 43, 493; Fossils, Index to American, Bassler, **41,** 148.

Organic remains in iron-bearing Huronian rocks in Minnesota, Grout and Broderick, 48, 199. Orthophragmina, etc., American

species, Cushman, 50, 468. Osteological material from

Machu Picchu, Eaton, 42, 86. Paleogeography, Paleozoic, in

the Arctic, Holtedahl, 49, 1, 308.

GEOLOGY.

Paleontologic Contributions, Ruedemann, 43, 337.

Paleontology, present tendencies, Berry, **48,** 1.

Paleozoic crustal instability in No. Amer., Schuchert, 50, 399. - formations Finmarken. of Holtedahl, 47, 79, 85.

- of Lake Timiskaming, Hume,

50, 293.

Palm, from Cretaceous of New Jersey, Berry, **41,** 193.

Parasuchian from the Triassic of Pennsylvania, Sinclair, 45,

Pebbles. unusual method rounding, in West Australia, Jutson, 48, 429. Pectinidæ of Texas, Kniker, 47,

234.

Pelecypoda, Harris, 48, 398.

Pelecypods, new, Cretaceous, No. Alberta, McLearn, 49, 83.

Pennsylvanian of Kansas, granite bowlders in, Twenhofel, 43, 363; series in Missouri, Hinds and Greene, 41, 222.

Perisphinctinæ, orthogenetic development of the costæ, O'Con-

nell, **48,** 450. Permian in Trans-Pecos, Texas,

47, 79 Permo-Carboniferous red beds of No. America, Case, 41, 219.

Phosphates, Florida, Sellards, 41, 299; Matson, 41, 300.

Plants, fossil, see Plants.

Pleistocene deposits, age of, Hay, 47, 361.

- Mt. Desert Island, Blaney

and Loomis, 42, 399.

- period, life of, Baker, 50, 170. - submergence in New York, Fairchild, **50**, 238.

Pliocene history of Mississippi, Shaw, **46,** 547.

Pliohippus Iullianus, Troxell, 42,

335. Portage fauna in the Mackenzie River Valley, Kindle, 49, 84.

Potomac formation, coniferous Sinnott and Bartlett, woods, 41, 276.

Pottsville formations and faunas of Arkansas, etc., Mather, 43,

Pre-Cambrian, Adirondack, Alling, 48, 47.

GEOLOGY.

Pre-Cambrian era, Lawson's correlation, Lane, 43, 42.

nomenclature, Schuchert, 42, 475.

– and Carboniferous algal deposits, Twenhofel, 48, 339.

Protichnites and Climactichnites, Burling, 44, 387.

Pseudorthoceras knoxense, Girty. 42, 387.

Quaternary geology of Wisconsin, Alden, 47, 143.

Rensselærina, new genus, Dunbar, **43,** 467. Ripples and related surface

forms, Bucher, 47, 149, 241. Rock tanks and charcos, Bryan,

50, 188.

Sail fish from the Virginia Miocene, Berry, 43, 461.

Sand grains, rounding of, Galloway, 47, 270; Kindle, 47, 431. San-Jorge formation in Pats Pata-

gonia, Windhausen, 45, 1. San Lorenzo series of middle California, Clark, 46, 769.

Scranton coal, Colorado, age of, Richardson, 43, 243; list of fossils, Knowlton, 43, 243.

Scyphocrinus, Springer, 44, 337. Sheet-flows, Niagara district, West Australia, Jutson, 48, 435. Shells, fossil in Boston basin,

Morse, 49, 157. Silicispongiæ, Cretaceous, O'Con-

nell, 49, 152.

Silurian geology of Ontario Peninsula, Williams, 49, 83; rocks of No. Michigan, Savage and Crooks, 45, 50; strata of Es-thonia, Russia, Twenhofel, 42, 437.

Stegosaurus, stenops, Gilmore,

47, 236.

Stone Age, men of, Osborn, 41, 217.

Strata, determination of depth and thickness, Palmer, 47, 236. Strophomenidæ of the Kristiania region, Holtedahl, 41, 562.

Stylemys nebracensis, Case, 47, 435.

Taconic system resurrected, Schuchert, 47, 113.

Tejon Eocene of California, Dickerson, 42, 80. Terebratulas, Swedish, Hadding,

49, 307.

question,

GEOLOGY.

Terraces, marine, in southeastern Connecticut, Hatch, 44, 319. Tertiary faunal horizons of

Washington, Weaver, 42, 81. - formations of Washington,

Weaver, 43, 337; of Porto Rico, Maury, 48, 209.

- Mammalian faunas of the Mohave Desert, Merriam, 48, 399.

Tetrabelodon osborni, new, Barbour, 41, 522.

Tetracentron-Drimys

Wieland, 49, 382. Tetracoralla from the Niagaran of Michigan, Ehlers, 48, 461; and Hexacoralla, Robinson, 43,

337. Texas, Llano Estacado, water of,

Baker, 41, 373. Ticholeptus etc., Loomis, 50, 281.

Timiskaming County, Quebec,

Wilson, **46,** 547. - Lake, Paleozoic, Hume, **50,**

Tomistoma americana, Sellards, 42, 235.

Tortoise, new, Sellards, 42, 235. Trias of New Zealand, Trechman, 47, 445.

Triassic life of the Connecticut Valley, Lull, 41, 147.

- and Jurassic, Idaho, Mansfield, **50**, 53. Trilobites. See **Trilobites**. Tumularia, Paleozoic alcyonar-

ian, Robinson, 42, 162.

Tunicates from Sicily, Jackel, 49, 305.

Venus mercenaria in Boston basin till, Morse, 49, 57. Raton floras, Vermejo and

Knowlton, 47, 74.

Vertebrate footprints, Oklahoma, Jillson, 44, 56.

- life in the late Paleozoic in No. America, Case, 49, 306.

Wasatch and Salt Lake formations, Mansfield, 49, 399.

Geophysical laboratory, Washington, work of, Sosman, 46, 255.

- papers from. See Ferguson, Larsen, Merwin, Rankin, Wash-ington, White, Wyckoff, et al. - observations at Burrinjuck, N. S. W., Cotton, 43, 170.

Getman, F. H., electrochemical equivalents, 44, 399; Chemistry, **46,** 765.

Gilbert, G. K., obituary notice,

Davis, 46, 669. Giles, A. W., brecciation in Niagara limestone, Rochester, N. Y., 47,

Gill, H. E., phosgenite, 47, 430. Gilmore, C. W., Armored Dinosauria of U. S. Nat. Museum, 47, 236.

Giltner, W., microbiology, 42, 87. Girty, G. H., apical end of Pseudorthoceras knoxense, 42, 387.

Glacial, control theory of reefs, Daly, 41, 175; 48, 136. - modification of drainage, New

York, Hausman, 45, 153. - period, life, Baker, 50, 170.

- till, Boston basin, shells in,

Morse, 49, 157. Glaciation, Cuzco, Peru, Gregory, 41, 39; Paleozoic, Alaska, Kirk, 46, 511; Pennsylvania, Williams, 44, 83.

Glasgow University, geological publications, **42**, 503; **45**, 334. Glass Mts., Texas, geology, Ud-

den, **47,** 387.

Gleditsch, E., life of radium, 41, 112.

Glenn, M. L., melanterite and chalcanthite groups, 50, 225. Goff, E. S., Plant Culture, 42, 284.

Gold deposition in the Bendigo gold field, Stillwell, 47, 388.

Goldschmidt, V., Atlas der Krystallformen, 50, 397; Krystallographie and Mineralogie, Beiträge, 50. 398.

Gooch, F. A., Quantitative Analysis, 41, 294; electrolytic analysis, 43, 391; platinized anode of glass in the electrolytic determination of manganese, 44, 53; chlorate method for determination of alkali metals, 44, 381; determination of thorium, 45, 227; of fluorine, 45, 370; determination of vanadic acid, 46, 427; barium and strontium, separation, 46, 538.

Goodale, G. L., development of botany since 1818, 46, 399.

Grabau, A. W., Geology of Non-Metallic Mineral Deposits, 50, 468.

Grand Canyon, Cambrian, Schu- Hatschek, E., Chemistry of Colchert, 45, 362; Carboniferous, Schuchert, 45, 347; fossil footprints, Lull, 45, 337; Story of, Darton, 44, 158.

Granite bowlders of Kansas, Twenhofel, 43, 363; 48, 132; Powers,

44, 146. see Rocks.

Gravitation, possible limit to, Very, 48, 33.

- and relativity, Woolard, **45**, 425. - and Isostasy, Bowie, **43**, 249. Greger, D. K., Devonian of Central

Missouri, 49, 265; 50, 20. kuaweoweo.

Gregory, H. E., geology of the Cuzco Valley. Peru, 41, 1; geology of the Navajo Country, 45, Hawkins, A. C., geology of Rhode 145; progress in interpretation of land forms, 46, 104; co-operation in geologic instruction, 47, 281.

Grout, F. F., lopolith, 46, 516; organic remains in iron-bearing Huronian rocks in Minnesota,

48, 199. Gruenberg, B. C., Biology, 48, 477;

49, 84. Guppy, H. B., fossil botany in America, 49, 372.

H

Haas, P., Chemistry of Plant Products, 45, 242. Hackh, I. W. D., modification of

the periodic table, 46, 481.

Hague, Arnold, biographical notice, Diller, 44, 73. Hale, A. J., Electrolysis in Chem-

ical Industry, 47, 135.

Hale, G. E., National Academies.

Hale, W. J., Chemistry, 44, 399. Hall, W. T., Chemistry, 42, 74. Hamor, W. A., phosgenite, 47, 430. Hanna, G. D., Geological Notes on

Pribilof Islands, 48, 216. Hare, Robert, Life of, Smith, 44, 76.

Harper, L. F., uplift on coast of New South Wales, 44, 48.

Harris, G. D., Pelecypoda, 48, 398. Harshberger, J. W., Mycology and Plant Pathology, 45, 335.

Harvey, E. N., Animal Light, 50, 474.

L., marine terraces in Southeastern Connecticut, 44, 319.

loids, 41, 368; 48, 160; 50, 73; forms assumed by drops and vortices, 47, 383.

Hausman, L. A., glacial modification of drainage within a narrow area, 45, 153.

Haüy, Abbé, 45, 326. Hawaii, Bishop Museum, 49, 156. — lava from Mauna Loa, 1916,

Jaggar, 43, 255.

- petrology, Powers, 50, 256. - selensulphur, Brown, 42, 132. - see Kilauea, Mauna Loa, Mo-

Island, 46, 437; 47, 308. Hay, O. P., relative ages of Pleis-

tocene deposits, 47, 361. Hazard, D. C., Magnetic Tables and Charts for 1915, 45, 236.

Heart, Starling, 45, 424.

Heat of formation by combustions with sodium peroxide, Mixter, 27; specific, of silicates, White, 47, 1; at higher temperatures, White, 47, 44.

Hébert (1857) on periodic submergence of Europe, Schuchert,

43, 35. Hedrick, E. R., Logarithmic Tables, **50**, 467

Hegner, R. W., Zoology, 41, 150. Helium, hydrogen and mercury, ultra-violet spectra, Richardson and Bazzoni, 45, 73.

- lines, broadening of, Merton, 47, 385; in the ultra-violet, Lyman, 49, 81.

Helvetica, Chimica Acta, 46, 480.

Henderson, Chemistry, 45, 233. Henderson, W. D., Physics, 42, 500. Hering, C., electrochemical equiv-

alents, 44, 399. Herrick, C. J., Neurology, 45, 485. Herrick, F. H., Audubon, the Nat-

uralist, 45, 150. Herschel, Macpherson, 50, 395. Hess, F. L., tactite, product of con-

tact metamorphism, 48, 377. Hildebrand, J. H., Chemistry, 46, 614.

Hill, D. W., solution of metals in ferric salts, 42, 301; solution of

silver in chromic acid, 45, 54. Hill, T. G., Chemistry in Plant Products, 45, 242.

Hillebrand, W. F., Analysis of Silicate and Carbonate Rocks, 49,

Hillsboro sandstone, Prosser, 41,

Himalayas, structure of, Oldham, 45, 76.

Hindu Achievements in Science,

Sarkar, 47, 230. Hogshooter gas sand, Berger, 48,

Holleman, A. F., Inorganic Chem-

istry, 43, 80.

Holm, T., Studies in the Cyperaceæ, no. XXVII, 48, 17; no. XXVIII, 49, 195; no. XXIX, 49, 429; no. XXX, 50, 159.

Holmes, S. J., Animal Biology, 47,

309

Holtedahl, O., Paleozoic formations of Finmarken, 47, 79, 85; Paleozoic paleogeography in the Arctic, 49, 1, 308. Hommel, W., Petrography, 50, 75.

Honess, A. P., etching figures of beryl, 43, 223; etching figures of the dihexagonal alternating type, 45, 201.

Hood, G. W., Horticulture, 41, 381. Hooker, Sir Joseph D., Life by F. O. Bower, **50,** 78.

Hopewell-Smith, A., Histology of the Mouth, 46, 480; 47, 148. Horse, early Pliocene one-toed,

Troxell, 42, 335.

Hough, G. J., cocinerite, 48, 206. Houstoun, R. A., Theory of Color

Vision, **42**, 433.

Huff, W. J., estimation of phosphorous, etc., acids in mixture, 45, 91; hydrolysis, etc., of hypophosphoric acid, 45, 103; preparation of hypophosphates, 46, 587.

Hulett, G. A., water content of coal, 43, 89; moisture content of

typical coals, 45, 174. Human Body, McMurrich, 41, 225. - remains, fossil, in Florida, Sellards, 42, 1; 47, 358. - Skeleton, Walter, 47, 81.

Hume, G. S., Paleozoic outlier of Lake Timiskaming, 50, 293.

Hunt, W. F., melanochalcite, 41,

Huntington, E., World Power and Evolution, **48**, 396.

Huronian. Minnesota, organic structures in, Grout and Broderick, **48,** 199.

Hussakof, L., Palæoniscid from South Dakota, 41, 347; new Cyprinid fish from British Co-

lumbia, 42, 18. Huxley, T. H., Physiology, 41, 151. Hydrogen, oxygen, etc., molecules

of, Silberstein, **43**, 330.
- spectra, Stark, **41**, 465. CHEMISTRY.

Hyman, L. H., Zoology, 49, 84.

1

Ichikawa, S., Japanese minerals, 42, 111; 44, 63; 48, 124.

Idaho, phosphate field, Mansfield, 50, 53; Wasatch and Salt Lake formations, Mansfield, 49, 399. Iddings, J. P., densities of igneous

rocks, 49, 363.

— obituary, 50, 316. Illinois Coal, Parr, 41, 225.

— Devonian, Savage, 49, 169. - geol. survey. See GEOL. RE-PORTS.

- waters of, chemical survey, 44, 160.

Inbreeding and Outbreeding, East and Jones, 49, 385. Index, Book Review, 49, 226.

— Industrial Arts, 49, 455. India, Board of Scientific Advice report 1914-1915, 42, 284; 1915-1916, **45**, 239; 1916-1917, **47**, 240; 1917-1918, **49**, 388; 1918-1919, **50**,

– Geology, Wadia, **49,** 219.

- See Hindu.

Indices, refractive, new method of determining, 42, 498.

Induction, unipolar, Kennard, 43, 332.

Industrial Arts Index, 49, 455. Insects, Connecticut, Viereck, 44,

83. See GEOLOGY. Insurance and Annuities for Teach-

ers, Pritchett, 42, 169. Interference of reversed spectra, Barus, 41, 414; fringes, rotation, Barus, 42, 63.

Interferometry, spectrum, Barus,

41, 414; **42,** 63, 402; **43,** 145. **Invertebrate** Types, Morphology of, Petrunkevitch, 43, 421. Ionium from uraninite, Gleditsch,

41, 115.

Ionization of acids, Drushel and | Jeffrey, E. C., Anatomy of Woody Felty, **43**, 57.

- of iodide solutions, Van Name and Brown, 44, 453.

Ions and electrons, motion of through gases, Wellisch, 44, I. - and Ionizing Radiations, Crow-

ther, 49, 381.

- recombination by X-rays, Jauncey, **42,** 146.

Iowa, Devonian of, Hackberry stage, Fenton, 48, 355

geol. survey. See GEOL. RE-PORTS.

Iron ore in Wisconsin, Savage and Ross, 41, 187.

Isostasy, mathematics, Chamberlin, 49, 311; MacMillan, 49, 318.

- nature and bearings, 48, 281; status of theory, Barrell, 48, 291. - and coral reef problem, Molengraaf, 44, 153.

- and gravity, Bowie, 43, 249. - and the planetesimal theory, ·Chamberlin, 42, 371.

compensation, distribu-Isostatic tion of, Bowie, 43, 471.

Isotopes, spectra, Merton, 49, 80; melting points, 50, 314.

Isotopic lead, Clarke, 46, 764; Richards, 47, 224; separation, Richards and Hall, 43, 409.

Jacoby, H., Navigation, 45, 74. lauea, 44, 161.

Jamieson, G. S., double salts of cæsium chloride, 43, 67; hydrogen peroxide determination, 44, 150.

Japan, minerals from, Ichikawa, 42, 111; **44,** 63; **48,** 124.

— Operculina, Yabe, 47, 80.

— Ophiuroidea. 44, 404.— Tarumai dome, Simotomai, 44,

- Sakura-jima Eruptions, 1914, **43**, 338.

Japanese Earthquake Commission,

42, 84. Jauncey, G. E. M., effect of magnetic field on recombination of ions by X-rays, 42, 146.

Jeans, J. H., Cosmogony, 49, 150.

Plants, 45, 152. Jenkins, O. P., spotted lakes of

epsomite, 46, 638. Jewels and Charms, Kunz, 41, 224. Jillson, W. R., vertebrate foot-prints in Oklahoma, 44, 56; re-cent eruption of Mt. St. Helens, Wash., 44, 59; migration of head-

waters divide of Right Middle Creek, Kentucky, 47, 60. Jobling, E., Catalysis, 41, 368. John Crerar, Library, bibliographical publications, 41, 379.

Johnson, C. N., Teeth, 46, 772. Johnson, D. W., Shore Processes,

48, 395. Johnston, J., forms of calcium car-

bonate, 41, 473.

Johnstone, J. H. L., relative activity of radium and uranium, 50, I. Jointing, a factor in degradation of

lithosphere, Ehrenfeld, 42, 168. Jones, D. F., Inbreeding and Out-

breeding, 49, 385.

Jones, H. C., Nature of Solution, 44, 78.

Jones, I. H., Equilibrium and Vertigo, 48, 79. Jones, T. J., Negro Education, 44,

487.

Jonson, E., law of dissipation of motion, 46, 578.

Joplin, Mo., zinc and lead deposits, Siebenthal, 41, 375. Jordan, E. O., Food Poisoning, 44, 158.

Jaggar, T. A., lava flow from Journal de Physique, 50, 395.

Mauna Loa, 1916, 43, 255; volcanologic investigations at Kiin sub-arid West. Australia, 48, 429; sheet-flows in the Niagara district in West. Australia, 48,

K

Kansas, Comanchean and Dakota strata, Twenhofel, 49, 281.

granite in, Powers, 44, 146; Twenhofel, 43, 363; 48, 132.

Katmai, Alaska, volcanic emanations, Shipley, 50, 141. Kelp, free carbon monoxide in,

Langdon, 43, 165. Kempson, E. W. E., Electricity

and Magnetism, 41, 146.

Kentucky, formations of Chester series, Ulrich, 47, 232.

Kentucky geology, Miller, 49, 219;

Jefferson Co., Butts, 41, 374.
- migration of headwaters divide of Right Middle Creek, Jillson, 47, 60.

Mississippian formations, Butts, 47, 232.

- oil and gas resources, Jillson, 49, 152.

Keokuk geodes, Van Tuyl, 42, 34. Keyes, C., rotating straticulate

spheroid, **47**, 108.

Kilauea, changes of level of lava, Jaggar, 43, 255; cyclical variations in eruption, Wood, 45, 146; explosive ejectamenta, Powers, 41, 227; volcanologic investigations, Jaggar, 44, 161.

Kindle, E. M., bottom marine

faunas of Bay of Fundy, 41, 449; Devonian faunas of the Mac-Kenzie River Valley, 42, 246; rounding of sand grains, 47, 431.

Kinetic theory, cosine law, Knudsen, 43, 83.

Kingsbury, J. E., Telephone, 41, 297.

Kingsley, J. S., Comparative Anatomy of Vertebrates, 45, 240.
Kirk, E., Paleozoic glaciation in

Alaska, 46, 511. Knight, C. W., euxenite in Ontario, 44, 243; Nickel Deposits, 45, 239. Knowlton, F. H., flora of the Morrison formation, Colo., 49, 189.

Kobayashi, M., electrolytic analysis, 43, 391; platinized anode in determination of manganese, 44, determination of thorium,

45, 227; of fluorine, 45, 370. Kozu, S., augite from Stromboli, 45, 463.

Kraemer, H., Pharmacognosy, 41,

Kraus, E. H., melanochalcite, 41, 211 Krogh, A., Respiratory Exchange

of Animals and Man, 43, 422. Kryshtofovich, A. N., Cretaceous age of the "Miocene flora" of

Sakhalin, **46,** 502. Krystallformen, Atlas der, Goldschmidt, 50, 397.

Krystallographie, Zeitschrift, 472.

Kunz, G. F., Magic of Jewels and Charms, 41, 224; Rings, 43, 339; Precious Stones in 1917, 47, 238; and Platinum in 1919, 50, 471.

Laboratory Manual, Clark, 45, 420. Lahee, F. H., Field Geology, 43, 172.

Lake Iroquois, etc., Coleman, 44,

351, 487. Lake Timiskaming, Paleozoic outlier, Hume, 50, 293.

Lambert projection, 48, 164. Lamellibranchs, living, of New

England, Morse, 45, 477. Lane, A. C., Lawson's correlation of the Pre-Cambrian era, 43, 42. Laney, F. B., geology of the Virgilina district of Virginia, 45, 476. Lankester, Sir R., Diversions of a

Naturalist, 41, 151.

Larsen, A., Oersted's discovery of Electro-magnetism, 1820, 50, 466. Larsen, E. S., sulphatic cancrinite from Colorado, 42, 332; optical character of sulphatic cancrinite, 43, 420; eakleite, 43, 464.

- melanterite and chalcanthite

groups, 50, 225. Larue, G. R., Animal Biology, 50, 76.

Lau Islands, see Fiji.

Lava eruption of Stromboli, 1915, Perret, 42, 443; flow from Mauna Loa, 1916, Jaggar, 43, 255; Morro Hill, Calif., Waring, 44, 98. - See ROCKS.

Law of error, genesis, Sampson, **47,** 226.

See Lane. Lawson. Lead, radioactive, 43, 166.

– See **CHEMISTRY.**

Least Squares, Theory, Weld, 41, 562.

Lecat, M., Azeotropism, 49, 217; Pensées sur la Science, etc., 49, 218.

Lecithin, Maclean, 46, 549.

Lee, J., Telegraphy, 45, 237.
Lee, T. H., two new zircon minerals, 47, 126; ferrazite, 48, 353.
Lee, W. T., Morrison formation, Colorado, 49, 183; Manzano group, New Mexico, 49, 323.

Lees ovial aberrations Tillyer

Lenses, axial aberrations, Tillyer

and Shultz, 45, 474. Lepper, G. H., Nebula to Nebula,

47, 386. Les Bas, G., Molecular Volumes, 41, 294.

Lester, O. C., emanation electroscopes, 44, 225; radioactive mineral springs of Colorado, 46, 621. Lewis, J. V., Mineralogy, 41, 149. Lewis, W. C. McC., Physical Chem-

istry, 42, 75; 48, 160. Lewis, W. K., Industrial Chemis-

try, **42,** 165.

Library of Congress, report, 1915, 41, 379; 1917, 45, 150; 1918, 47, 150; 1918, 47, 141; 1919, 49, 309. Licks, H. E., Mathematics, 43, 415. Life, Chemical Sign of, Tashiro, 44, 84.

— Origin and Evolution, Osborn,

Light, Animal, Harvey, 50, 474.

— diffusion by gases, Fabry, 47, 70.

— Electromagnetic Theory, Silberstein, **47,** 140.

— polarization by gases, Strutt,

47, 137.

- rays, signalling by, Wood, 49, 214.

scattering by dust free air, Strutt, 46, 615; by solids, Strutt, **48,** 392.

Lightning, ball, Mathias, 43, 248. Lillie, F. R., Fertilization, 48, 162;

Embryology, **49**, 222. **Lipari,** rhyolites, Washington, 50, 446.

Lockhart, L. B., American Lubri-

cants, 45, 418. Lochhead, W., Entomology, 47,

Loeb, J., Forced Movements, Animal Conduct, etc., 47, 81.

Logarithmic, Tables, Hedrick, 50, 467.

Lombard, R. H., determination of dissociation pressures of sul-

phides, 43, 175. Long, Eleanor T., formation of

salt crystals, 43, 289. Loomis, F. B., Pleistocene locality on Mt. Desert Island, 42, 399; an unusual mastodon, 45, 438; 217; Eocene amphibian, 47, Ticholeptus rusticus and the Oreodonts, 50, 281. Loughlin, G. F., crandallite, 43, 69.

Lubricants, American, Lockhart,

45, 418. Lull, R. S., Triassic life of the Connecticut Valley, 41, 147; functions of the "sacral" brain in Dinosaurs, 44, 471; fossil footprints from the Grand Canyon, 45, 337; development of vertebrate Paleontology, 46, 193; obituary notice of S. W. Williston, 47, 220; new Tertiary Artiodactyls, 50, 83; Carbon footprints, Mass., 50, 234. Carboniferous

M

MacCurdy, J. T., War Neuroses, **47,** 147.

Mack, E., moisture content of coal, **43,** 89; **45,** 174.

Mackenzie River Basin, Camsell and Malcolm, 49, 451; Valley Devonian, Kindle, 42, 246.

Maclean, H., Lecithin and Allied

Substances, 46, 549. MacMillan, W. D., mathematics of

isostasy, 49, 311. MacNutt, B., Physics, 43, 168. Macpherson, H., Herschel, 50, 395.

Madagascar, minerals, 43, 174. Magnesium, single-line radiation, McLennan, 42, 78.

Magnetic declination in the U. S., Jan. 1, 1915, Hazard, 41, 466.

- field, effect on recombination of ions produced by X-rays, Jauncey, 42, 146.

- susceptibilities of gases, Honda

and Okubo, **49,** 377. —Tables and Charts for 1915, Hazard, 45, 236.

Magnetism, and Electricity, Kempson, **41,** 146.

— Theory of, Gans, 41, 464. Mahin, E. G., Quantitative Analysis, **47**, 440.

Maine, Champlain submergence, Meserve, 48, 207; Pleistocene, Blaney and Loomis, 42, 399.

Man, fossil remains, Vero, Florida, Sellards, 42, 1; 47, 358.

Manganese minerals, San José, Calif., Rogers, 48, 443.

Mann, C. R., Engineering Educa-

tion, 46, 772.

Mansfield, G. R., western phosphates of the U. S., 46, 591;
Wasatch and Salt Lake formations of Idaho, 49, 399; Triassic and Jurassic in Idaho, 50, 53.

Maps, Topographic, Finch, 50, 236.

Margerie, translation of Suess, 47,

235. Marsh Collections of vertebrates, Lull, 50, 83; Thorpe, 50, 207; Troxell, 49, 391; 50, 243, 361, 431. Marshall, C. E., Microbiology, 43,

Educational Maryland Commission, report, 42, 88. GEOL. - geol. survey. See

REPORTS.

Masius, M., Physics, 44, 404. Mastodon, new longirostral, Barbour, 41, 524; Loomis, 45, 438. So. Carolina,

Materia Medica, Sayre, 44, 86.

Mathematical Analysis, Whittaker and Watson, 41, 297; Literature, Miller, 41, 369; Tracts, Edinburgh, Whittaker, 41, 226, 298. Mathematicians, International Con-

gress, 50, 79.

Mathematics, Licks, 43, 415.

- for Agriculture, Kenyon and

Lovitt, 45, 144.

Mather, K. F., Pottsville formations and faunas, 43, 133. Matson, Florida phosphates,

300. Matsumoto, H., Japanese Ophi-

uroidea, 44, 404. Matter, Life of, Turnbull, 49, 221. - and Electricity, Comstock and Troland, 43, 414.

— and Energy, Crehore, 45, 76.

Mauna Loa, 1914 eruption, Wood,
41, 383; 1916, lava flow, Jaggar,

43, 255.

Maury, C. J., calcium carbonate concretionary growth, 44, 369;
Porto Rican Tertiary formations, 48, 209.

Maxted, E. B., Catalytic Hydro-

genation, 47, 441. McDonnell, C. C., lead-chlor arsenate, 42, 139.

McEwan, E. D., Ordovician of Indiana, 50, 154.

McLaughlin, H. M., Qualitative Analysis, 48, 469. McLearn, F. H., Silurian Arisaig series of Nova Scotia, 45, 126. McLennan, E., Cosmical Evolution,

43, 169. McMurrich, J. P., Human Embryology, 41, 225.

McPherson, Chemistry, 45, 233. Meade, R. K., Chemists' Manual, 45, 416.

Means, A. H., Utah Minerals, 41,

Meany, E. S., Mt. Rainier, 43, 417. Measurements, Theory, Tuttle, 44,

Mechanics of Fluids, Barton, 41, 146.

Survey Melanterite and chalcanthite mineral groups, Larsen, Glenn, 50,

Mellor, J. W., Inorganic Chemistry, **46,** 541.

Men of the Old Stone Age, Osborn, 41, 217.

Mendelism, Punnett, 49, 384.

Merriam, J. C., mammalian fauna of the Mohave Desert, 48, 399.

Merrill, G. P., catalogue of meteorites in U. S. Nat. Museum, 42, 283; calcium phosphate in meteoric stones, 43, 322; Florida meteorite, 45, 64; History of American State Geol. Surveys, 50, 395.

Merwin, H. E., forms of calcium carbonate, 41, 473; interpolations on spectrograms, 43, 49; ternary system, MgO-Al₂O₃-SiO₂, 45, 301; melting points of cristobalite and tridymite, 46, 417; hydrated ferric oxides, 47, 311; ternary system, CaO-MgO-SiO₂, 48, 81; wollastonite and the ternary sys-

tem, 48, 165.

Meserve, P. W., Champlain submergence on Maine Coast, 48,

207.

Metallurgists Handbook, Liddell, 41, 558.

Metallurgy, Thum, 47, 298. Metals, Chemical Combinations, Giua and Robinson, 46, 689.

- Physical Chemistry, Schenck and Dean, 49, 147.

Meteoric Stones, calcium phos-

phate in, Merrill, 43, 322.

Meteorite iron, from Tertiary Deposits, 47, 449; stone, Eustis, Florida, Merrill, 45, 64.

Meteorites of No. America, Cata-

logue, Farrington, 41, 223.
Catalogue of, in U. S. National

Museum, Merrill, 42, 283.

- radioactivity, Quirke and Fin-

kelstein, 44, 237; 45, 144.
— structure, etc., Farrington, 41, 376.

Meteorological Tables, Smithsonian, **49,** 216.

Mexico, Liassic Flora, Wieland, 42,

Michigan, Silurian rocks of northern, Crooks, 45, 59.

Microbiology, Giltner, 42, 87; Marshall, 43, 421.

Milk, Fredericksen, 49, 86; deter-

mination of added water in, MINERALS. Keister, 44, 331. Miller, D. C., Science of Musical

Sounds, **41**, 561.

Miller, E., Origin of Planetary Sys-

tem, 46, 542. Miller, E. R., dustfall of March 9,

1918, **46**, 599; **47**, 133. **Miller, G. A.,** Mathematical Litera-

ture, 41, 369. Miller, W. G., euxenite in Ontario,

44, 243; Nickel Deposits, 45, 239. Miller, W. J., Introduction to His-

torical Geology, 43, 87. Millikan, R. A., Electron, 44, 333;

Physics, **50**, 394.

Mills, J., Realities of Modern Science, 49, 81. Mine Supplies, Stronck and Bill-

yard, 43, 492.

Mineral Deposits, Geology of Non-Metallic, Grabau, 50, 468.

- Industries of Vermont, 43, 490; **50**, 238.

- Resources, Philippine Islands, 1914, 41, 224; Texas, Phillips, **41,** 224.

— See GEOL. REPORTS. U.S.

Mineralogia, d'Achiardi, 41, 377. Mineralogic Notes, Schaller, 42, 85. Mineralogist, American, 47, 147. Mineralogy, Descriptive, Bailey, 44, 486; Determinative, Lewis, 41,

149; Elements of, etc., Moses and Parsons, 43, 420.

- Australian, Bibliography, An-

derson, **43,** 339.

of Black Lake Area, Quebec, Poitevin and Graham, 46, 479. — Growth, 1818-1918, Ford, **46, 2**40.

Minerals, Madagascar, 43, 174. — Manganese, San José, Calif.,

Rogers, 48, 443. - opaque, determination, M1117-

doch, **42**, 85.

- radioactive, density of lead from, Richards and Wadsworth, 41, 293.

- synantectic, Sederholm, 43, 338.

- of the Ural Mts., 43, 174. — of Utah, Means, 41, 123.

- tear-figures, Kuhara, 47, 448.

MINERALS.

Adamite, Utah, 41, 125. Akermanite-gehlenite system, 50, 131. Albanite, 41, 567. Alumogel, 41, 567. Ambatoarinite, 41, 567.

Amesite, 49, 96. Anglesite, Idaho, 47, 287. Anhydrite, 42, 233. Apatite, Maine, 44, 245. Apthitalite, California, 49, 367. Aragonite, and other forms of CaCO₃, **41**, 479. Arsenic, native, Japan, **42**, 117. Arsenobismite, 41, 127, 567. Asbestos, Quebec, 44, 156. Augite from British Columbia, 43, 75; Stromboli, 45, 463. Aurobismuthinite, 41, 567. Bäckströmite, Sweden, 49, 452.

Barite, Calif., 48, 443. Bassetite, 41, 567. Belbaite, 41, 567. Beryl, etching figures, 43, 223. Bilinite, 41, 568. Bismite, Utah, 41, 126. Bismutite, Utah, 41, 127. Bismutoplagionite,

166, 452. Bornite, composition, 41, 409. Bütschlite, 41, 568. Cacoclasite, Quebec, 48, 440. Calcite, etchings, 45, 221; Japan, 42, 113; 48, 124; relation to other forms of CaCO₃, 41, 478. Cancrinite, sulphatic, Colorado, 42, 332, 505; optical character, 43, 420. Carnegieite, 43, 115, Carnotite, radium from, 41, 214. Catoptrite, Sweden, 44, 484. Chalcantnite, coloral, 50, 228. Chillagite, 41, 568, Chubutite, Argentine, 47, 446. Cleveite, Norway, 42, 365. cinerite, Mexico, 48, 206; 49, 452. Colerainite, Quebec, 45, 478; **46,** 479. Collbranite, Korea, 45, 477. Conchite, 41, 490. Cordierite, Japan, 42, 115. Conchite, 41, Covellite, 43, 184. Crandallite, 43, 60, 493. Creedite, Colorado, 42, 504. Crestmorcite, 44, 486. Cristobalite, California, 45, 222; melting point, 46, 417.

Daubréeite, Utah, 41, 126. Dendrites of manganese oxides, 44, 67. Diabantite, 42, 233. Diamond, dispersion, 47, 441; So. Africa, 47, 238, 448; in 1919, 50, 472. Diasporogelite, 41, 568. Doelterite, 41, 568; Dufreniberaunite, 41, 568. Dyscrasite,

Australia, 49, 278. Eakleite, California, 43, 464. Echellite, Ontario, 452. 49, Ectropite, Sweden, 484. 44,

MINERALS.

Elbaite, 41, 568. Emeralds, Colombia, 42, 85. Epsomite, 46, 638. Euxenite, Ontario, 44, 243.

amatinite, Nevada, 44, 469. Ferrazite(?), 48, 353; 49, 452. Ferri-allophane, 41, 568. Ferrierite, British Columbia, 47, Famatinite, 448. Ferroludwigite, **43**, 494. Flokite, Iceland, **44**, 485. Francolite in meteorites, 43, 322. Furnacite, 41, 568.

Galena, Japan, 42, 111. ophyllite, Calif., 48, 443. Gan-Garnet crystals, 44, 63. Gavite, 49, 452. Gehlenite, 43, 476; 50, 131. Geocronite, Utah, 41, 125. Geraesite, 41, 569. Gilpinite, Colorado, **45**, 477. Goethite, **47**, 341. Goyazite, **41**, 359; **43**, 163, 420. Graphite, Adirondacks, 47, 145. Griffithite, 43, 494. Grossouvreite, 41, 569. Gypsum crystals, **44**, 65.

Halloysites, so-called, 43, 140.
Hamlinite, 41, 359; 43, 163.
Hausmannite, Calif., 48, 443.
Heliodor, 41, 569. Hibbenite,
British Columbia, 42, 275.
Heckömite, Lapland, 47, 446. Hogbömite, Lapland, 47, 446. Holmquistite, 41, 569. Hydrozincite, 42, 59.

Ivaite, Idaho, 45, 118. Jarosite, Utah, 41, 126.

Kalbaite, 41, 569. Kaliophilite, 43, 116. Kaolinite, 48, 353. Katoptrite, 44, 485. Ktypeite, 41, 489. Kundaite, 41, 569.

Lechateliérite, 41, 569. Leifite, Greenland, 42, 504; 47, 447. Lepidocrocite, 47, 345. Leucite, 43, 117; 50, 33. Limonite, New Mexico, 47, 344; pseudomorph, 42, 233. Lorettoite, 43, 494. Lublinite, 41, 490.

Magnesioludwigite, 494. Magnesite, etchings, 45, 215. Manganfayalite, Sweden, 49, 452. Margarosanite, New Jer-49, sey, **42**, 159, 505; Sweden, **44**, 485. Melanochalcite, **41**, 211. Melanterite, Colorado, 50, 225. Melilite, 43, 476. Merrillite, Melilite, 43, 476. Merrillite, 44, 486. Metatorbernite, 41, 139. Minasite, 41, 569. Mullanite, Montana, 45, 66, 478.
Natrolite, British Columbia, 42, 130. Minasite, Montana, 45, 66, 478.

MINERALS.

Natromontebrasite, 472. 41, Naumannite, Idaho, 50, 569. 390. Nephelite, composition, etc., 43, 115, 127.

Oliveiraite, Brazil, 47, 126, 447. Oruetite, Spain, 49, 452. Orvillite, Brazil, 47, 126, 447.

Paredrite, 41, 356, 569. Periclase, California, 46, 581. Phosgenite, 47, 430. Pinite, Japan, 42, 115. Platinum in 1919, 50, 471. Psilomelane, Calif., 48, 443. Pyrite, 43, 188. Pyrobelonite, Sweden, 49, 453. Pyrochroite, Calif., 48, 443. Pyrolusite, 44, 76. Pyromorphite, 43, 325. Pyrrhotite, 43, 189.

Racewinite, Utah, 47, 447. Rhodochrosite, etchings, 45, 216; Calif., 48, 443. Riversideite, 44,

Schernikite, 41, 569. Selensul-phur, Hawaii, composition, 42, 132. Serpentine, **46**, 693. Siderite, etchings, 45, 216. Smithsonite, etchings, **45**, 217. Sobralite, Sweden, **49**, 453. Spencerite, British Columbia. **42,** 275, 505; **43,** 494; **44,** 486. Sphalerite, Japan, **48,** 124. Sphenomanganite, Sweden, **49,** Stibiobismuthinite, 41, 453. 569. Stichite, 46, 479. Sulphohalite, California, 49, 76.

Tephroite, Calif., **48**, 443. Thanite, **41**, 569. Tin deposits, Virginia, **45**, 477. Torbernite, **48**, 195. Tridymite, **46**, 417. Tungstenite, Utah, 45, 478. Turgite, 47, 345.

Uranospathite, 41, 569.

Vaterite, 41, 486. Vegasite, 41, 570. Villamaninite, Spain, 49, 453.

Wavellite, 48, 353. Winchellite, 41, 570. Wollastonite and the ternary system, 48, 165.

Zebedassite, Italy, 47, 447. Zincblende, Japan, 48, 124. Zincores, genesis of, St. Lawrence Co., N. Y., 47, 145. Zinkdibraunite, 41, 570.

Mines, Canada Bureau of, publications, **41**, 467, 469; **42**, 84; **44**, 81;

ninth, 49, 153; publications, 42, 83; 44, 80; 45, 80, 476; 48, 77; **49,** 450; **50,** 470. **Mining** World Index, Vol. VIII,

42, 90.

Minnesota geol. survey, 49, 383. - Pigeon Point geology, Daly, 43,

Mirrors, Prisms, etc., Southall, 47, 228.

Mississippi embayment, erosion intervals of, Berry, 41, 222.

geology, etc., Lowe, 41, 375 Mississippian, correlation, Ver-

wiebe, 43, 301. Missouri cherts, formation, Dean, 45, 411; Devonian, Greger, 49, 265; geology, Branson, **47**, 78; 49, 267; Pike Co., limestone, Rowley, **41**, 317.

Mitchell, C. A., Edible Oils and

Fats, 46, 615.

Mixter, W. G., thermochemistry of silicon, 42, 125; calorimetry with combustions sodium peroxide, 43, 27.

Model Drawing, Wright and Rudd,

43, 332.

Mohave Desert, Tertiary Mammalian faunas, Merriam, 48, 399.

Mokuaweoweo, Eruption of 1914, Wood, 41, 383.

Molecular currents, Ampère, Einstein and de Haas, 41, 558. Molecules, influence of finite vol-

ume on equation of state, Shaha and Basu, 47, 73.

Molengraaff, Coral reefs and isos-

tasy, 44, 153. Molinari, E., Inorganic Chemistry,

Montana, Devonian fauna, Haynes, 41, 375; geology and economic deposits, Rowe and Wilson, 43, 491.

Moodie, R. L., diseased vertebræ of a Sauropodous dinosaur, 41, 529; Coal Measures amphibia of

North America, 42, 502. Mook, C. C., Morrison formation, 43, 85.

Moore, C. R., Embryology, 49, 222. Morgan, G. T., Arsenic and Antimony, 46, 615.

Morphology and Anthropology, Duckworth, 41, 564.

Morrison formation, dicotyledonous flora, Knowlton, 49, 189; Colorado type section, Lee, 49,

Morro Hill, Cal., lavas, Waring, 44, 98.

Morse, E. S., living lamellibranchs of New England, 48, 477; fossil shells in Boston basin, 49, 157.

Moses, A. J., Elements of Min-

eralogy, etc., 43, 420. Motion, law of dissipation, Jonson, **46**, 578.

Moulton, F. R., Astronomy, 43, 17. Histology, Hopewell-Mouth,

Smith, 46, 480; 47, 148. Mt. Desert Island, Pleistocene locality, Blaney and Loomis, 42,

399 Mt. Rainier, Meany, 43, 417.

Mulliken, S. P., Identification of Organic Compounds, 42, 166. Munroe, C. E., sand fusions from

gun cotton, 43, 389. Murchison Medal, London Geol.

Society, **45**, 478. Murdoch, J., determination opaque minerals, 42, 85. Musical Sounds, Miller, 41, 561.

Muter, J., Chemistry, 44, 400.

N

Napier Tercentenary Volume, Knott, 42, 89.

Narragansett Basin, Dighton Conglomerate, Perkins, 49, 61. National Museum, U. S., report, 41,

378; Catalogue of meteorites, 42, 283.

Physical Laboratory, **43,** 249. Research Council. See **Re-**- Research Council.

search Council. Naturalist, Diversions of a, Lan-

kester, **41,** 151. Nature, Jubilee number, 49, 86.

Nature Study, Biological, Downing, 48, 162.

Navajo Country, geology, Gregory, **45**, 145.

Navigation, Jacoby, 45, 74. Nebraska, alkali resources, Barnew mastodon, bour, **43,** 491; Barbour, 41, 522; Proboscidea, Ligamentum teres in, Barbour,

41, 251. Nebula to Nebula, Lepper, 47, 386. Negro Education, Jones, 44, 487. Nelson and Hayes Rivers, geology, Tyrrell, **43**, 85.

Neocalamites, Berry, 45, 445. Neon, atmospheric, constitution, 49, 445.

Nephelites, sodium-potassium,

Bowen, 43, 115. Nernst, W., Theoretical Chemistry, 43, 486.

Nevada, genesis of ores at Tonopah, Bastin and Laney, 48, 246. Neville, H. A. D., Practical Chem-

istry, **49**, 376.

Nervous Impulse, Conduction of, Lucas and Adrian, 45, 335. - System, Involuntary, 42, 87; Parker, 47, 452. Gaskell,

Nervousness, Mastery of, Carroll,

45, 241.

Neurology, Herrick and Crosby, **45**, 485.

New Jersey, palm, Berry, 41, 193. Newman, H. H., Vertebrate Zoology, 49, 384. Newman, L. F., Practical Chemis-

try, 49, 376. New Mexico, ammonoids, Böse, 49, 26; geology, Lee and Knowlton, 47, 74, 142; Luna County, Darton, 42, 82; Manzano group, Lee, 49, 323; Pecos Valley, Tertiary intrusives, Semmes, 50, 415; stratigraphy of Eastern, Baker, 49, 99; Tertiary intrusives Semmes Co., 50, 415.

New South Wales, Burrinjuck, geophysical observations, Cotton, 43, 170; uplift on coast, Harper, 44,

New York State Museum, paleoncontributions, Ruedetologic mann, 43, 337; reports, 12th 43,

251; 13th 46, 545; 14th 49, 151. ew Zealand, block mountains.

Cotton, 44, 249; 45, 149.

- Cretaceous faunas, Woods, 45,

- Cretaceous and Tertiary fishremains, Chapman, 48, 475. - geol. survey. See GEOL. RE-

PORTS. - Institute of Science, 1919, 48,

474. - Trias, Trechman, 47, 445. - vegetation of Lord Howe Is., Oliver, 45, 148.

Nickel Deposits, Miller and Knight, 45, 239.

Nitrates, Chili, 49, 298.

Nitrogen and oxygen, electric resolution, Yoshida, 47, 443.

Nomenclature, pre-Cambrian, Schuchert, 42, 475. North Carolina geol. survey, 48,

Northrup, E. F., Laws of Physical

Science, 44, 79.
Northwest and Northeast Passages, 1576-1611, Alexander, 41, 47I.

Norway, geology of Finmarken, Holtedahl, 47, 79, 85.

Norwegian Arctic Expedition, geol. report, Holtedahl, 45, 333; **50,** 169.

Nova Scotia, Arisaig Silurian, Mc-

Learn, **45,** 126. **Noyes, W. A.,** Organic Chemistry, **43**, 81; **49**, 444.

0

OBITUARY.

Abbe, Cleveland, 42, 509. Aitken, J., 49, 86. Assheton, R., 41, 152. Atkinson, G. F., 47, 84. Backhouse, T. W., 50, 82. Baeyer, A. von, 44, 338. Baird, J. B., 47, 454. Barrell, F. R., 41, 226. Barrell, J., 47, 454, 48, 251. Bastian, H. C., 41, 152. Becker. G. F., 47, 300: 48, 242. Becker, G. F., 47, 390; 48, 242. Beebe, W., 43, 342. Bell, R., 44, 338. Blake, J. M., 50, 316. Blanchard, R., 47, 454. Bouchard, C. J., 41, 152. Brashear, J. A., 49, 390. Braun, F., 48, 402. Buchner, E., 44, 338.

Cairnes, DeL. D., 44, 338. Chappuis, P., 41, 382. Choffat, M. P., 48, 250. Clark, W. B., 44, 247. Crookes, Sir W., 47,

454.

Danne, J., 47, 454. Darboux, J. G., 43, 497. Debus, H., 41, 306. G., 43, 497. Debus, H., 41, 306. DeCandolle, A. P., 50, 82. Deprez, M., 47, 240. Derby, O. A., 41, 152. Dresser, H. E., 41, 226. Drysdale, C. W., 44, 338. DuBois, H. E. J. G., 47, 240. Duhem, P., 42, 509. Eastman, C. R., 46, 692. Elliot. D. G., 41, 306. Ellis, W., 43, 174

Farlow, W. G., 48, 80; 49, 87. Galitzin, Prince B., 42, 372. Gautier, Armand, 50, 398. Gerard, E., 41, 472. Gilbert,

OBITUARY.

G. K., 45, 485; 46, 669. Gregory, R. P., 47, 148. Haeckel, E. H., 48, 250. Hague,

Arnold, 43, 497; 44. 73. Hauron, L. D. du, 50, 474. Hayes, C. W., 41, 382. Heckel, E., 41, 472. Hidden, W. E., 46, 480. Hilgard, E. W., 41, 226. Hinde, G. J., 45, 485. Hitchcock, C. H., 48, 478. Holden, C. F., 41, 152. Hopkins, C. G., 48, 478. Hughes, T. McK., 44, 160. Hull, Edward, 45, 80.

Iddings, J. P., 50, 316. Irving,

J. D., 46, 550.

Jones, H. C., 41, 472. Judd, J.
W., 41, 472. Julien, A. A., 47,

W., 41, 472. Julien, A. A., 47, 454. Jungfleisch, E., 42, 90. Jungersen, H. F. E., 44, 86. Kennedy, H. T., 44, 160. Lambe, L. M., 47, 454. Lapworth, C., 49, 389. Lebour, G. A., 45, 424. Letts, E. A., 45, 424. Lignier, O., 42, 90. Low-

A., 43, —
424. Lignier, O., 42, 90.
ell, P., 42, 509.

Maclaurin, R. C., 49, 156. Marcoun, J. M., 49, 455. Markham, Sir C. R., 41, 382. Massee, G., 43, 497. Messel, R., 49,

Metchnikoff, E., 42, 170.

Metchniko Miller, N. H. J., 43, 342. Moberg, J. C., 41, 306. Mohn, H., 43, 88. Moses, A. J., 49, 389. Oliver, D., 43, 174. Osler, Sir

Wm., 49, 156.
Pavlov, I. P., 41, 382. Pearson,
H. H. W., 43, 88. Peary, R.
E., 49, 226. Peckham, S. F.,
46, 620. Pedler, A., 46, 480.
Pfeffer, W., 49, 455. Phillips,
W. B., 46, 692. Pickering, E. C., 47, 240. Pirsson, L. V., 49, 86; 50, 173. Prosser, C. S., 42,

86; 50, 173. Prosser, C. S., 42, 372. Purdie, T., 43, 342. Ramsay, Sir W., 42, 170. Rathbun, R., 46, 620. Rayleigh, Lord, 48, 249. Raymond, R. W., 47, 148. Reid, C., 43, 174. Rhys, Sir J., 41, 306. Richards, C. B., 47, 454. Richard, J. W., 41, 472. Ricketts, P. deP., 47, 84. Roscoe, Sir H. E., 41, 152. Royce, L. 42, 372. Rücker, Sir Royce, J., 42, 372. Rücker, Sir

42, 372. Schwarzschild, K., 42, 372. Seligmann, G., 50, 172.

OBITUARY.

Smith, H. H., 47, 390. Stock-well, J. N., 50, 398. Stone, G. H., 44, 86. Strutt, J. W., 48, 249. Stuart, T. P. A., 49, 390.

Sylow, L., 47, 390.
Thompson, S. P., 42, 90. Tiddeman, R. H., 43, 497. Tornquist, S. L., 50, 474. Trail, J. W. H., 48, 478. Trowbridge, C. C., 46, 550. Turner, Sir W., 41, 382.

Van Hise, C. R., 47, 84. Vasseur, G., 41, 152. Vaughan, A., 41, 226. Von Bardeleben, K. H.,

47, 454.
Watson, W., 47, 390. Watts, W. M., 47, 240. Whitman, F. P., 49, 226. Williams, H. S., 46, 550. Williston, S. W., 46, 620; 47, 220. Worthen, G. C., 47, 454. Worthington, A. M., 43, Wright A. W. 41, 152 174. Wright, A. W., 41, 152, 361. Wrightson, J., **43**, 174. Zeiller, C. R., **41**, 226.

Oceanica, continental fracturing and diastrophism, Schuchert, 42, 91.

Oceanography, Buchanan, 49, 217; Italian investigations, 45, 335.

O'Connell, M., costæ in the perisphinctinæ, 48, 450.

Ohio, Berea formation, Verwiebe, 42, 43; Building Stones, Bownocker, 41, 224; geologic map, Bownocker, 50, 239.

Oil Fields, Mid-Continent, Bosworth, **49,** 450.

Oil Geology, Ziegler, 45, 423. Oil and gas resources of Kentucky,

Jillson, **49,** 152. Oils and Fats, Mitchell, 46, 615.

Oklahoma, Hogshooter gas sand, Berger, 48, 189. Oldham, R. C., Structure of the

A., 41, 152.

Sabine, W. C. W., 47, 390. Sarasin, E., 44, 338. Schwalbe, G.,

44, 351, 487; Peninsula, geology, Williams, 49, 83; shore-line, origin and age, Spencer, 43, 351. Ophiuroidea, Japanese, Matsumoto, Parker, G. H., Nervous System, 44, 404.

Optical contact of glass by heat, Parker and Dalladay, 43, 411. Ordovician, Madison, Indiana, Mc-

Ewan, 50, 154. Oregon Cascades, geology, Smith, **46**, 546.

- radiolarian cherts, Smith, 42, 299, 504.

Oreodonts, Loomis, 50, 281.

Compounds, Identifica-Organic tion, Mulliken, 42, 166. Organism, Unity of, Ritter, 49, 220.

Osborn, H. F., Men of the Old Stone Age, 41, 217; Origin and Evolution of Life, 45, 77; Equidæ, **46,** 770.

Osteological Material from Machu

Picchu, Eaton, 42, 86, 281.

Ostwald, W., Colloidal Chemistry,
41, 295; 47, 226.

Ozark Highland, Missouri, geog-

raphy, **49**, 219. zone, Vosmaer, **42**, 432; absorp-Ozone, Vosmaer, 42, 432, ausorption bands, Fowler and Strutt, **45**, 143.

- and ultra-violet transparency of the atmosphere, Strutt, 46, 543.

P

Pacific Islands, problems, Daly, 41,

- volcanic domes in, Powers, 42, 261.

Page, L., a century's progress in physics, 46, 303.

Paleobotany, Seward, 49, Guppy, 49, 372; Wieland, 49, 382.
Paleogeography, Arldt, 50, 238; in the Arctic, Holtedahl, 49, 1, 308.
— See GEOLOGY, Cycads, etc.;

also Plants. Paleontology, Davies, 50, 467; von Zittel and Broili, 44, 336.

- Invertebrate, Woods, 50, 170. – present tendencies, Berry, 48, 1. - vertebrate, development, Lull, 46, 193.

Paleozoic diastrophism, Schuchert,

50, 339. - of Lake Timiskaming, Hume, 50, 293.

- See GEOLOGY.

Palmer, H. S., determination of depth of strata, and projection of dip, 47, 236.

47, 452.

Parsons, C. L., Elements of Mineralogy, etc., 43, 420.

Passivity, electron theory of, Dean, 47, 123.

Pasteur, History of a Mind, Du-claux, Smith and Hedges, 50, 80.

Patagonia, San-Jorge formation, Windhausen, 45, 1.

Pearl, R., Genetics, 41, 379. Pearson's method for arsenic determination, 48, 391.

Peat in Wisconsin, Huels, 41, 225. Pebbles, rounded, Australia, Jutson, 48, 429.

Pennsylvania,

geologic section, Butts, 46, 523; Middle Ordovician, Field, 48, 403; oil and gas map, 1915, 42, 84.

Periodic table, modification, Hackh,

46, 481.

Perkins, E. H., Dighton conglomerate of Mass. and Rhode Island, 49, 61.

Perret, F. A., lava eruption of Stromboli, 1915, 42, 443.

Perry, H., Theories of Energy, 45, 419.

Peru, Andes of, Bowman, 43, 416; Cuzco, geology, Gregory, 41, 1; Indians of, Ferris, 43, 339; osteological material from Picchu, Eaton, 42, 86, 281. Machu

Peters, C. A., succinic acid as a standard, 41, 244.

Peterson, O. A., American Diceratheres, **50,** 396.

Petrography, Hommel, 50, 75.

Petroleum Handbook, Andros, 49, 214.

Petrology, Weinschenk and Johannsen, 43, 173; Hawaiian, Powers, 50, 256; rise of, Pirsson, 46, 222.

Petrunkevitch, A., Morphology of Invertebrate Types, 43, 421.

Pharmacognosy, Kraemer, 41, 380. Philippine Islands, mineral resources, 1914, **41**, 224; Journal of Science Index, **45**, 424.

Phillips, A. H., new zinc phosphates from British Columbia, 42, 275; new forms of natrolite, 42, 472; vanadium in sedimentary rocks, 46, 473.

Phosphate deposits of Florida, Sellards, 41, 299; Matson, 41, 300.

Photographic phenomenon, 49, 146. Physical Science, Laws of, North-

rup, 44, 79. - Tables, Smithsonian, Fowle, 50,

Physics, a century's progress, Page, **46**, 303. Experiments in, Franklin and

MacNutt, **46**, 618. - General; Crew, 42, 501; Frank-

lin and MacNutt, 43, 168.

— Measurements, Ferry, 47, 138.

- Molecular, Crowther, 48, 473. - Practical, Millikan and Gale,

50, 394. in, Henderson, Problems 42,

500; Masius, **44,** 404. Technical, Anderson, 47, 229;

Arnold, 42, 437.

Textbook, Duff, 42, 436.

Physiology, Chemical, Cramer, 46, Elementary, Huxley, 41, 549; 151.

Phytopathology, Whetzel, 46, 549. Pidduck, F. B., Electricity, 42, 79. Piedmont terraces of Appalachians, Barrell, 49, 227, 327, 407.

Pierce, G. W., Electric Oscillations and Electric Waves, 49, 303.

Pigeon Point, Minnesota, Geology,

Daly, 43, 422. Pillsbury, W. B., Psychology, 43, 254.

Pirsson, L. V., rise of Petrology as a science, 46, 222.

Physical Geology, 50, 469.obituary notice, W. Cross, 50,

Planetary System, Origin, Miller, **4**6, 542.

Plants, see BOTANY.

- Australian flowering, geological history, Andrews, 42, 171; 43, 174, 339.

- fossil, Berry, 45, 78; Knowlton, 49, 189; Seward, 46, 475; 49, 223. - Mesozoic and Cenozoic of No. America, Knowlton, 49, 307.

- and animals, evolution, Berry, 49, 207.

Plaster of Paris, Troxell, 41, 199. Platinum, in 1919, 50, 471; in peridotite, Urals and Spain, Duparc, 43, 173; Russian, 49, 451.

Phosphates of the Western United States, Mansfield, 46, 591.

Phosphorus, geologic rôle, Blackwelder, 42, 285.

Phosphorus, geologic rôle, Blackwelder, 42, 285.

Pogue, J. E., emerald deposits of Mansfield Mansfield (Colorable Mansfield).

Muzo, Colombia, 42, 85. piseuille's law for c

Poiseuille's law compound tubes, Schleier, 49, 447.

Poisson's Equation, failure Prasad, 44, 333.

Polarimetry, 45, 418.

Polarization surface, Tentzsch-Gräfe, 48, 472.
Porter, J. G., All-American Time,

47, 310. Porter, L. E., detection and separa-

tion of tellurium, arsenic, etc., 42, 106; separation of gallium, 44, 221.

Porto Rico, 1918 Earthquake, 50, 236; Scientific Survey, 50, 237.

- Tertiary formations of, Maury, 48, 209.

Posnjak, E., hydrated ferric oxides, **47,** 311.

Potash, extraction from rocks, Ross, 43, 485. - See **CHEMISTRY**,

Potential measurements, switch for, White, 46, 610.

Pottsville formations and faunas,

Mather, 43, 133. Powers, S., explosive ejectamenta of Kilauea, 41, 227; volcanic domes in the Pacific, 42, 261; granite in Kansas, 44, 146; Butler salt dome, Texas, 49, 127; Hawaiian petrology, 50, 256.

Pratt, H. S., Zoology, 41, 150. Pre-Cambrian era, Lawton's correlation, Lane, 43, 42; see GE-OLOGY.

Precious Stones in 1917, Kunz, 47, 238; in 1919, 50, 471.

· in 1914, Sterrett, 41, 223. Precipitation, rhythmic, and diffusion, Stansfield, 43, 1.

Pressure, effect on crystals and rocks, Bridgman, 45, 243.

growth of - external,

under, Taber, 41, 532.

Pribilof Islands, geological notes on, Hanna, 48, 216.

Prickly Pear, Australia, Alexander,

48, 475.

Priestley memorial, 44, 332.

Prime numbers, Thompson, 45, 418. Projectile, motion of a spinning, Prescott, 45, 329.

Prosser, C. S., stratigraphic posi-

Psychology, Pillsbury, 43, 254;

Watson, 49, 221. Pumpelly, R., My Reminiscences,

Punnett, R. C., Mendelism, 49, 384. Pyromorphite crystals, Shannon, 43, 325.

Pyrometry, Practical, 45, 75.

Q

Qualitative, Quantitative Analysis, See CHÉMICAL WORKS. Queensland Museum memoirs, 41, 225; **43**, 422; **47**, 452. **Quirke**, **T**. **T**., radioactivity meteorites, 44, 237.

R

Radiation constants, Henning, 48, new secondary, of positive rays,

Wolfke, 45, 331.

- terrestrial, transmission of, Very,

41, 513. Radio communication, 47, 444.

Radioactive lead, atomic weight, Richards and Wadsworth, 43, 166; density, 41, 293; 42, 365. mineral springs of Colorado, 46,

621. Radioactivity, Makower and Gei-

ger, 49, 304.

Radioscopic fluorescent screens, Roubertie and Nemirovsky, 48,

Radium, absorption spectrum, de Broglie, 49, 79.

- from carnotite, Parsons, et al., 41, 214.

life of, Gleditsch, 41, 112.

Radium and uranium ratio, Lind and Roberts, 50, 72; relative activity, Boltwood and Johnstone, 50, I, 72.

Radium-D, beta-rays, Meitner, 41,

Raman, C. V., mechanical theory of bowed strings, 48, 74.

Ramsay, W., Gases of the Atmos-

phere, 41, 557.
Rainier, Mt., Meany, 43, 417.
Rankin, G. A., the ternary system, MgO-Al₂O₃-SiO₂, 45, 301.

tion of Hillsboro sandstone, 41, Rathbun, Mary J., fossil crab, 41, 344; decapod Crustaceans, 47, 234

Rathbun, R., obituary, 46, 757. Raymond, P. E., Beecher's classification of trilobites, 43, 196.

Reagents and Reactions, Tognoli, **45**, 328.

Reese, A. M., Zoology, 47, 452. Reeves, J. R., Anderson esker, 50,

65.

Refraction, determination of indices of, Fabry, 49, 143, 148. Refractive indices, determination, Fabry's, Uhler, **49,** 143, 148.

Relativity, Cunningham, 41, 297. — Einstein-Lawson, 50, 405.

generalized, and gravitation theory, **43,** 247.

- and gravitation, Woolard, 45, 425.

Religion and Science, Woodburne,

Research Council, National, organization, **48,** 163; **49,** 156; **50,** 79;

building, **50,** 473. **Resistance-box** plugs, lubrication,

Manley, 43, 331. Respiratory Exchange of Animals, and Man, Krogh, 43, 422.

Rhode Island, geology, Hawkins, 46, 437; Perkins, 49, 61. Richardson, G. B., age of Scranton

coal, Colorado, 43, 243. Richardson, O. W., Emission of Electricity from Hot Bodies, 42, 369. Richter's Organic Chemistry, Spiel-

mann, 48, 469. Richthofenia in Texan Permian,

Böse, 44, 157. Ridgway, R., Birds of No. America, 42, 86; 48, 402.

Ries, H., Economic Geology, 43,

252, 339; dolomitic clay, 44, 316. Righi, Augusto, 50, 466. Rings, Kunz, 43, 339.

Ripple marks, recent and fossil, Kindle, **43,** 491.

Ripples, origin of Bucher, 47, 149, 241. of fossil, etc.,

Ritter, W. E., Unity of Organism, 49, 220.

Robbins, H. E., conductivity cell for electro-titration, 41, 246. Robbins, W. W., Botany of Crop

Plants, 45, 242. obertson, T. B., Physical Chem-Robertson, T. B., Physical istry of Proteins, 46, 548.

Robinson, H. H., summation of ROCKS. analyses of igneous rocks, 41, Rocks, 257; Barrell's Piedmont terraces

edited, 49, 227, 327, 407. obinson, W. I., Paleozoic Alcyo-Robinson, narian Tumularia, 42, 162; Tetracoralla, etc., 43, 337.

ROCKS.

Bahiaite, 41, 330.

Calcite-brucite rocks, Rogers, 46,

Charnockite series, Washington, 41, 323.

Chemical Analyses, Washington, 45, 238; 48, 161. Diabase, Rhode Island, 46, 452; cylinders, Emerson, 41, 321.

Gabbro, lopolith, Grout, 46, 516; Rhode Island, Hawkins, 455

Granite, Kansas, Powers, 44, 146; Twenhofel, 43, 363; 48, 132.

- hypersthene, 41, 324. — Killarney, Collins, 41, 564. Green schist, Rhode Island, 46,

449. Hommel's Petrography, 50, 75. Hyalo-dacite, 50, 453.

Italite, new, 50, 33. Lavas of Morro Hill, Cal., War-

ing, **44,** 98.

Leucite rock, 50, 33. Magmatic sulphide ores, Tolman and Rogers, 44, 156.

Metagabbro, etc., Adirondacks, 48, 147.

Myrmekite, 43, 338.

Nephelite rocks, Hawaiian, 50, 274.

Norite, **41**, 328.

Obsidian, Lipari, 50, 446. Peridotite, Spain, Urals, 43, 173.

Pumicite, Nebraska, Barbour, 44, 83. Quartz diorite, hypersthene, 41,

Rocks, Analysis, Hillebrand, 49,

78. - of Cuzco, Peru, Gregory, 41,

Cuttingsville,

- eruptive, at Cuttingsvill Vermont, Eggleston, **45,** 377.

- foliation and metamorphism,

Bonney, 48, 477.

— Igneous, of Carrizo Mountain, Arizona, Emery, 42, 349; densities of, Iddings, 49, 363; summation of analyses, Robinson, 41, 257.

Silicate, extraction of potash, Ross, 43, 485.

Rhyolites, Lipari, 50, 446. Tertiary intrusives in New Mexico, Šemmes, 50, 415.

Trachyte, Hawaiian, 50, 268. Rockwood, E. W., Chemical Anal-

ysis, 41, 144.

2 Mts., Mesozoic physiog-Rocky Mts.,

raphy, Lee, 47, 78. Rodents of Iowa, Stoner, 47, 239.

Rogers, A. F., cristobalite in California, 45, 222; American occurrence of periclase, 46, 581; manganese minerals, San Jose,

Calif., 48, 443. Roscoe, H. E., Biographical Sketch, Thorpe, 43, 80. Rose, J. N., Cactaceæ, 49, 222.

Ross, C. S., age of iron ore in Eastern Wisconsin, 41, 187. Rowley, R. R., Edgewood lime-

stone of Pike Co., Missouri, 41, 317.

Russell, E. J., Soils and Manures, 42, 283; Soil Conditions and Plant Growth, 45, 423.

Rutherford, E., penetrating power of X-rays, 44, 401.

Ruthven, A. G., Animal Biology, **50,** 76.

Rydberg Series Constant, Curtis, **49,** 300.

St. Lawrence river, birth of, Spen-

cer, 43, 351.
"Miocene Sakhalin, Kryshtofovich, 46, 502.

Sakura-jima, Eruption Koto, 43, 338.

Salt crystals, formation, Long, 43, 289.

- deposition, Grabau, 50, 468.

- dome, Texas, Powers, 49, 127. Sand fusions from gun cotton,

Munroe, 43, 389. rounding of, Galloway, 47, 270; Kindle, 47, 431. angamon, Ill.,

Sangamon, fossil from, Wickham, 44, 137.

Massachusetts. Sanitation, State, Whipple, 43, 496.

Sarawak Museum Journal, 46, 479. Sarker, B. K., Hindu Achievements in Science, 47, 230.

Sauchelli, U., succinic acid as a standard, 41, 244.

Savage, T. E., age of iron ore in Eastern Wisconsin, 41, 187; Early Silurian rocks of No. Michigan, 45, 59; Devonian of Illinois, 49, 169.

Sayles, aqueo-glacial sediments, 50,

Sayre, Materia Medica, 44, 86. Schaller, W. T., mineralogic notes,

42, 85; crandallite, 43, 69; identity of hamlinite with goyazite, 43, 163; Gems, 47, 145. Schenck, R., Physical Chemistry

of Metals, 49, 147. Schmucker, S. C., Evolution, 41, 151. Schneider, A., Food and Drug Lab-

oratories, 41, 381; Microbiology of Foods, 50, 172.

Schrammen, Collection of Cretaceous Silicispongiæ, 49, 152.

Schuchert, C., continental fracturand diastrophism · in Oceanica, 42, 91; pre-Cambrian nomenclature, 42, 475; Hébert (1857) on periodic submergence of Europe, 43, 35; Carboniferous of the Grand Canyon of Arizona, 45, 347; Cambrian of the Grand Canyon of Arizona, 45, 362; historical geology, 1818-1918, 46, 45; notice of H. S. Williams, 46, 682; Earth's Changing Surface, 46, 770; Taconic system resurrected, 47, 113; fossil hydroid Beatricea, 47, 293; obituary notice of J. Barrell, 48, 251; Paleozoic crustal instability in No. America, 50, 399. Science, Century of, 1818-1918, 46,

I; 47, 310.

- Elements of General, Caldwell and Eikenberry, 46, 600.

– Introduction, Clark, 45, 420. – Realities of Modern, Mills, 49,

81. - Short History of, Sedgwick and

Tyler, 45, 240.

Teaching, Twiss, 45, 332.
Scott, S. E., detection and separation of germanium, 44, 313; 46,

Scott, W. B., Evolution, 44, 84. Scott, W., determination of vanadic

acid, 46, 427. Scott, W. W., Chemical Analysis, 48, 70.

Scranton Coal, Colorado, age, Richardson, 43, 243.

Sedgwick, W. T., History of Science, 45, 240. Sedimentation, Shaw, 49, 84.

Sediments, aqueo-glacial, Sayles, **47**, 446.

Seidell, A., Solubilities of Inorganic and Organic Compounds, **49,** 78.

Sellards, E. H., Florida phosphates, 41, 299; fossil human remains, discovery in Florida, 42, 1; new tortoise from Florida, 42, 235; human remains at Vero, Florida, 47, 358; Comanchean formation

under Florida, 48, 13.
emmes, D. R., Tertiary intrusives Semmes, D. R., Tertiary intrusives of the Pecos Valley, New Mex-

ico, 50, 415.

Serpentine, origin, Benson, 46, 693. Seward, A. C., Fossil Plants, 46,

475; 49, 223. Shannon, E. V., crystals of pyromorphite, 43, 325; famatinite from Goldfield, Nevada, 44, 469; mullanite, 45, 64; ilvaite, Idaho, 45, 118; anglesite, Idaho, 47, 287; amesite, 49, 96; bismutoplagionite, 49, 166; naumannite in Idaho, **50,** 390.

Sheet flows, etc., Australia, Jutson, **48**, 435.

Sherman, H. C., Chemistry of food, **46,** 548. Shimer, H. W., fossiliferous Mio-

cene bowlders, Block Island, 41, 255.

Shipley, J. W., volcanic emanations Katmai, Alaska, 50, 141. Shore Processes, etc., Johnson, 48, 395.

Shuler, E. W., Dinosaur tracks in Glen Rose limestone, Texas, 44,

Shull, A. F., Animal Biology, 50, 76. Siebenthal, C. E., zinc and lead deposits of Joplin, 41, 375.

Signalling by light rays, Wood, 49, 214.

Silberstein, L., Electromagnetic

Theory of Light, 47, 140.
Silicate specific heats, White, 47, 1. Silliman, Benjamin, founder of the Amer. Journal of Science, 46, 11. Simotomai, H., Tarumai dome in

Japan, 44, 87. Simpson, G. S., detection and separation of tellurium, arsenic, etc.,

42, 106. Sinclair, W. J., new labyrinthodont

Pennsylvania, 43, 319; Parasuchian from the Triassic

of Penn., 45, 457. Sinnott, E. W., coniferous woods of the Potomac formation, 41, 276.

Skeats, E. W., coral-reef problem and Funafuti borings, 45, 81; and dolomite formation, 45, 185. Smith, A. J., Chemistry of Metabol-

ism, translation, 42, 442.

Smith, C. M., lead-chlor arsenate, 42, 139; Electric and Magnetic Measurements, 43, 415.

Smith, E. A., Zinc Industry, 46, 689. Smith, E. F., Life of Robert Hare, 44, 76; Life of James Woodhouse, 46, 541; Electro-Analysis, 46, 766; Chemistry in Old Philadelphia, 47, 383; James Cutbush, Amer. Chemist, 1788-1823, 49, 79.

Smith, G., dyscrasite, Australia, 49,

Quantitative G. McP., Smith, Chemical Analysis, 48, 468.

Smith, G. O., century of government geological surveys, 46, 171. Smith, W. D., radiolarian cherts in

Oregon, 42, 299, 504.

Smithsonian Institution, annual report, 1915, 41, 303; 1916, 43, 87; 1917, **45,** 149; 1918, **47,** 146; 1919, **49,** 154.

Field — Explorations and Work in 1916, 43, 497; 1919, 50,

— — Meteorological Tables, 49, 216.

- Physical Tables, Fowle, 50, 466. Smyth, C. P., moisture content of typical coals, 45, 174.

Soderman, M. A., barium and strontium, separation, 46, 538.

Sodium, line spectrum, Strutt, 49,

- vapor, fluorescence, Strutt, 41, 144; ionizing potential, Wood and Okano, 44, 401; resonance, radiation, Mohler and Wood, 47, 442.

See CHEMISTRY.

Soil Conditions and Plant Growth, Russell, 45, 423.

- Physics and Management, Mosier and Gustafson, 45, 484. Soils, manganese in, Johnson, 43, 410.

· and Manures, Russell, 42, 283. Solar radiation, 44, 482.

Solubilities of Inorganic and Organic Compounds, Seidell, 49, 78. Solution, Nature of, Jones, 44, 78.

Sosman, R. B., work of the Geophysical Laboratory, Washington, 46, 255.

Sounds of drops falling on water,

Mallock, 47, 136.

South Africa geol. survey, 41, 564. South America, Cretaceous-Tertiary boundary, Windhausen, 45, I.

- See **Peru.**

South Australia, Geology, Howchin, 47, 389; Jack, 45, 147; Talbot and Clarke, 47, 389.
- geol. survey. See GEOLOG-ICAL REPORTS.

Southall, J. P. C., Mirrors, Prisms, and Lenses, 47, 228.

Specific heats, silicate determination, White, 47, I. Spectograph, positive ray, Aston,

49, 444. Spectra, hydrogen, Stark, 41, 465.

- interference of reversed, Barus, 41, 414.

- iron, King, 46, 767.

– of isotopes, Merton, 49, 213. - of lead and thallium, Merton, 49, 213.

Origin, Thompson, 48, 70.

 rotation of interference fringes, Barus, 42, 63. - ultra-violet of helium, hydrogen,

etc., Richardson and Bazzoni, 45,

X-ray, iodine and tellurium, Siegbahn, 41, 465. Spectral series and atomic number,

Bell, 47, 227. Spectrograms, interpolations

Merwin, 43, 49.

Spectroheliograph, Rumford, Yerkes Observatory, Hale and Ellerman, 45, 472. Spectrum of helium, 49, 81.

- interferometry, Barus, 41, 414; **42**, 63, 402; **43**, 145.

of iron, Hemsalech, 43, 413. lines, distribution of intensity, Nicholson and Merton, 14, 466; structure of broadened, Merton,

42, 77. — of radium, 49, 79.

- solar, Einstein-displacement, 50, occurrence of ultra-violet bands in, Fowler and Gregory, 46, 617.

· See **Spectra.**

straticulate,

Spencer, S. R., separation

cæsium, etc., 42, 279.

Sphere moving in a liquid, inertia, Cook, 49, 379.

- plotting crystal zones on, Blake, 43, 237.

Spheroid, rotating, Keyes, 47, 108.

Seybert of report Spiritualism, Commission, 50, 81; Truth of, Mrs. D. Humphreys, 50, 81.

Springer, F., Mysticocrinus,

Standards, Bureau of, report, 49,

Stansfield, J., retarded diffusion and rhythmic precipitation, 43, I. Starling, E. H., Lecture on the

Heart, 45, 424. Stars of the Southern Heavens, Catalogue, Delavan, 49, 225.

Steels, Graphite, etc., Analysis, Johnson, **47**, 297.

Stefanini, G., geological history of Venetia, 44, 299.

Steiger, G., sulphatic cancrinite from Colorado, 42, 332.

Sterrett, D. B., Gems and Precious

Stones in 1914, 41, 223. revens, W. C., Plant Anatomy, Stevens, **42**, 284.

Stevenson, J. J., origin of form-

kohle, 43, 211. Stillman, T. B., Engineering Chem-

istry, **43**, 166. Stoddard, J. T., Organic Chemistry,

47, 135. Stoichiometry, Young, 46, 689. Stone Age, Men of, Osborn, 41, 217. Stratigraphy of Eastern New Mex-

ico, Baker, 49, 99; Lee, 49, 323. Stromboli, augite, Kozu and Washington, 45, 463; lava eruption, 1915, Perret, 42, 443. Strutt, R. J., electric discharges in

gases and vapors, 45, 234.
Succinic Acid. See CHEMISTRY. Suess, E., Face de la Terre, 47, 235. Sulphides, dissociation pressures of, Allen and Lombard, 43, 175. Sulphite, liquor, utilization, Tartar,

41, 367.

Sulphur, recovery, Wells, 44, 330. Sun-spots, nature, Hale, 47, 302. Surface Tension and Energy, Willows and Hatschek, 47, 302. Switch, electric, White, 46, 610.

Spencer, J. F., Metals of Rare Earths, 49, 78.

Spencer, J. W., origin and age of the Ontario Shore-line, 43, 351.

\mathbf{T}

Taber, S., growth of crystals under external pressure, 41, 532.

Tables for Engineers, etc., Ferris, **47,** 309.

Taconic system, Schuchert, 47, 113. Tactite, Hess, 48, 377.

Tampico, geology, Dumble, 47, 79. Tarr, W. A., origin of chert in the Burlington limestone, 44, 409; **45**, 149.

Tashiro, S., Chemical Sign of Life,

44, 84.

Tear-figures of minerals, Kuhara, **4**7, 448.

Technical Review, 50, 81.

Teeth, Filling, etc., Johnson, 46,

Telegraphy, Lee, 45, 237. Telephone, Kingsbury, 41, 297.

Temperature coefficient of a heterogeneous reaction, Van Name. 43, 449.

equilibrium of a body exposed to radiation, Fabry, 44, 480.

- variation, mean annual, Arctowski, **43,** 402.

Tennessee, Devonian of, Dunbar, 49, 307; geology of Rutherford

Co., Galloway, 50, 239.

Ternary system, CaO-MgO-SiO₂,
Ferguson and Merwin, 48, 81, 165; MgO-Al₂O₃-SiO₂, Rankin and Merwin, 45, 301.

Test, L. A., Qualitative Analysis, **48**, 469.

Texas, Butler salt dome, Powers, 49, 127; Dinosaur tracks, Shuler, 44, 294.

geology of, Udden, Baker and Böse, **43**, 252; Dumble. **50**, 238; of Glass Mts., Udden, Baker and Bowman, **47**, 79, 387; Böse, **47**, 305.

- Mineral Resources, Phillips, 41,

- Pectinidæ, Kniker, 47, 234.

- Permo-Carboniferous, ammonoids of, Böse, 47, 305. · University bulletin, 44, 158.

Thaxter, R., obituary notice of W. G. Farlow, 49, 87.

Thermochemistry of silicon, Mixter, 42, 125.

Thermoelement work, switch for, White, 41, 307.

Thomson, J. A., Brachiopoda of the Australasian Antarctic Expedition, 48, 397; Secrets of Animal Life, **49,** 220.

Thomson, J. J., Origin of Spectra, 48, 70.

Thorium, alpha-particles from, Ru-

therford, 41, 561. Thornton, W. M., Jr., separation of thorium from iron, 42, 151.

— See CHEMISTRY.

Thorp, F. H., Industrial Chemistry,
42, 165; 46, 615, 689; 47, 135, 382.

Thorpe, E., Biographical Sketch Thorpe, E., Biographical of H. E. Roscoe, 43, 80.

Thorpe, M. R., Abajo Mts., Utah, 48, 379; Oligocene (White (White **48**, 379; River) Felidæ, 50, 207.

Thum, E. E., metallurgy, 47, 298. Time, All-American, Porter, 47,

wave work as a measure of,

Coleman, **44, 3**51, 487. Tin, oxychloride of, new, Keller, **44,** 480.

- See **CHEMISTRY**.

Tintic Mining District, Utah, Geology, Lindgren and Loughlin, 48, 246.

Tizard, H. T., Theoretical Chemistry, **43**, 486.

Tognoli, E., Reagents and Reac-

tions, 45, 328.
Tothill, J. D., ancestry of insects, **42**, 373.

Transkei Country, So. Africa, geology, Rogers, 45, 146.

Treadwell, F. P., Analytical Chemistry, **42,** 74.

Triassic and Jurassic in Idaho, Mansfield, 50, 53.

Tridymite, melting point, Ferguson and Merwin, 46, 424.

Trigonometry, Barker, 45, 237. Trilobites, ancestry, Tothill, 42,

- appendages, Walcott, 47, 231. - Beecher's classification, Raymond, **43,** 196.

Bohemian, Novak, 49, 306.
Cambrian, Walcott, 41, 301; 42,

432.

— (Lichadidæ) Foerste, 49, 26. Troxell, E. L., plaster of Paris, 41, Pliocene one-toed 199; early horse, 42, 335; Oligocene camel, 43, 381; Oligocene Artiodactyl, 391; Entelodonts in the

Marsh Collection, 50, 243, 361, 431.

Turnbull, A., Life of Matter, 49, 221.

Turner, W. A., vanadium determined by cupferron, 41, 339; separation of vanadium, 42, 109.

Tuttle, L., Theory of Measure-

ments, 44, 79. Twenhofel, W. H., granite bowlders of Kansas, 43, 363; chert of the Wreford and Foraker limestone of Kansas, etc., 47, 407; granite bowlders of Kansas, 48, 132; Pre-Cambrian and Carboniferous algal deposits, **48,** 339; Co-Dakota strata, manchean and Kansas, 49, 281.

Twins, Biology, Newman, 44, 84. Twiss, G. R., Science Teaching, 45, 332.

Tyler, H. W., History of Science, 45, 240.

U

Uhler, H. S., gallium-indium alloy, 41, 351; electrolysis of gallium, 42, 389; 43, 81; note on paper by Ch. Fabry, 49, 143, 148. United States Bureau of Mines.

See Mines, U. S. Bureau of.

— Coast Survey. See Coast

Survey. - Geol. Survey. See **GEOL**.

REPORTS. - — magnetic declination, Jan. 1,

1915, Hazard, 41, 466. - map on Lambert projection, **48,** 164.

- National Museum. See National Museum.

Urine, Secretion, Cushny, 44, 159. Utah, Abajo Mts., Thorpe, 48, 379; Green River 'desert section, Em-

ery, 46, 551.
- Tintic Mining District, geology, Lindgren and Loughlin, 48, 246; minerals, Means, 41, 125.

Vancouver, geology, Burwash, 47, 79.

Vander Meulen, clays from Georgia and Alabama, 43, 140.

Van Klooster, Physical Η. S.,

Chemistry, 49, 147. Van Name, R. G., G., solution of metals in ferric salts, 42, 301.

Van Name, R. G., apparatus for determining freezing-point lowering, 43, 110; temperature coeflcient of a heterogeneous reaction, 43, 449.

- tri-iodide and tri-bromide equilibria, 44, 105; ionization of

cadmium iodide solutions, 44, 453. - solution of silver in chromic acid, 45, 54; estimation of phosphorous, etc., acids in mixture, 45, 91; hydrolysis and conductivity of hypophosphoric acid, 45, 103.

- preparation of hypophosphates,

Van Tuyl, F. M., geodes of the Keokuk beds, 42, 34; origin of dolomite, 42, 249; origin of chert, 45, 449

Vapors, fluorescent, Silberstein, 42,

499.

Vaughan, T. W., origin of barrier coral reefs, 41, 131.

Venetia, geological history, Stefa-

nini, 44, 299. Vennes, H. J., retardation of alpha particles by metals, 44, 69.

Vermont, eruptive rocks at Cuttingsville, Eggleston, 45, 377.

– Mineral Industries, 43, 490; 50,

238. Vero, Florida, fossil human re-

mains, Sellards, 42, 1; 47, 358. Vertebræ, Evolution of, Williston, **46**, 546.

Vertebrates, Comparative Anatomy, Kingsley, 45, 240.

Verwiebe, W. A., Berea formation of Ohio, etc., 42, 43; correlation of the Mississippian of Ohio, etc., 43, 301; Devonian shales of Ohio and Pennsylvania, 44, 33.

Very, F. W., transmission of terrestrial radiation, 41, 513; possible limit to gravitation, 48, 33.

Vibrations of bowed strings, mechanical theory, Raman, 48, 74. Villavecchia, V., Chemistry, 329; 46, 765.

Violins, mechanically played, Raman, 50, 465.

Virgilina district of Virginia, etc., geology, Laney, 45, 476. Virgin Is., Scientific Survey, 50, 237.

Virginia, geol. survey. See GEOL. REPORTS.

- Miocene, sail fish from, Berry, 43, 461.

Vogdes, A. W., Notes on Paleozoic Crustacea, 44, 336.

Volcanic domes in the Pacific, Powers, **42,** 261.

- emanations, Alaska, Shipley, 50,

IAI.

- eruption, on Mt. St. Helens, — eruption, on Mt. St. Helens, Wash., Jillson, 44, 59; of Sakura-jima in 1914, Koto, 43, 338.

— phenomena in Hawaii, 43, 255.

Volcano, see Kilauea, Mauna Loa.

— Tarumai, Simotomai, 44, 87.

Volcanoes, lava eruption of Stromboli, 1915, Perret, 42, 443.

Volcanologic investigations at Kilauea, Jaggar, 44, 161.

Von Fürth, O., Chemistry of Me-

tabolism, 42, 442. on Richter, V., Organic Chemis-Von Richter, try, **41**, 368. **Vosmaer, A.,** Ozone, **42**, 432.

W

Wade, B., Upper Cretaceous Ful-

gur, **43**, 293. **Wadia, D. N.,** Geology of India, **49**,

Walcott, C. D., Cambrian Trilobites, 41, 301; Cambrian formation of Montana, 42, 372; Cambrian Trilobites, 42, 439; appendages of Trilobites, 47, 231;

elected to French Academy, 49, 86. Walker Museum, Contributions, **42**, 82.

Walter, H. E., Human Skeleton,

47, 81.

War Neuroses, MacCurdy, 47, 147.

Waring, G. A., and C. A., lavas of
Morro Hill, So. California, 44, 98.

Warner, A. R., Dispensaries, 46, 77 I.

Warren, C. H., sphere for crystal optics problems, 42, 493; titaniferous augite, 43, 75.

Washburn, M. F., Animal Mind, **45,** 240.

Washington, Eocene and post-Eocene formations, Weaver, 42,

- University of, Bureau of Research, 41, 471.

Washington, H. S., Charnockite series of igneous rocks, 41, 323; chemical analyses of igneous

45, 238; augite from Stromboli, 45, 463; Chemical Analyses of Rocks, 48, 161; new leucite rock, 50, 33; rhyolites of Lipari, **50**, 446.

Water power in Canada, 49, 388. Watson, J. B., Psychology, 49, 221. Weed, H. T., Chemistry in the

Home, 45, 471. Weld, L. D., Theory of Errors and

Least Squares, 41, 562.

Wellisch, E. M., motion of ions and electrons through gases,

Wells, H. L., progress of chemistry, 1818-1918, 46, 259; Chemical Calculation Tables, 48, 161; an-

alytical weighing, 49, 375. West Indies, fossil Bryozoa, Canu

and Bassler, **49**, 83.

geology and paleontology, Vaughan, 49, 82.

West Virginia, coal beds, Hennen,

46, 770. geol. survey. See GEOL. RE-

PORTS. Western Australia geol. survey. See GEOL. REPORTS.

- rounding of pebbles, Tutson. 48, 429; sheet-flows, Jutson, 48, 435.

Whetzel, H. H., Phytopathology, **46**, 549.

Whipple, G. C., State Sanitation of

Massachusetts, 43, 496. White, W. A., Character Forma-

tion, 43, 254. White, W. P., switch for thermoelement work, 41, 307; switch for delicate potential measurements, 46, 610; silicate specific heats, 47, 1; specific heat determination at higher temperatures,

Whitlock, H. P., crystal structure,

49, 259.

Whittaker, E. T., Modern Analysis, 41, 297; Edinburgh Mathematical Tracts, **41,** 298.

Wickham, H. F., fossil beetles from Sangamon, Ill., 44, 137; fossil beetles, Vero, Florida, 47, 355.

Wieland, G. R., Flora Liasica de la Mixteca Alta, 42, 370; Fossil Taxonomy, Cycads, 43, American fossil cycads, 46, 645; classification of Cycadophyta, 47, 391; Tetracentron-Drimys question, 49, 382.

Wiley, H. W., Beverages, and Adulterations, 47, 297.

Williams, H. S., fauna of Chapman Sandstone of Maine, 42, 169. - obituary notice, Schuchert, 46, 682.

Williams, S. R., achromatoscope,

41, IOI. Williamson, E. D., forms of calcium

carbonate, 41, 473. Williston, Samuel W., notice, 47, 220. Winchell, A. N., dustfall of March

9, 1918, 46, 599; 47, 133. Windhausen, A., Cretaceous-Tertiary boundary in So. America, 45, 1; Argentine Neocomian, 47, 303.

Winton, A. L., Food Analysis, 44, 77.

Wisconsin, age of iron ore, Savage, and Ross, 41, 187.

- Fox-Winnebago Valley, 41, 374. geol. survey. See GEOL. RE-PORTS.

- peat resources, Huels, 41, 225.

- physical geography, 42, 83. - Quaternary Geology, Alden, 47,

143. Wood, H. O., 1914 eruption of Mo-

kuaweoweo, 41, 383. Wood, R. W., signalling by light

rays, 49, 214. Woodhouse, James, Life of, E. F. Smith, **46**, 541.

Woodruff, L. L., Origin of Life, 46,

Woods, H., Palæontology, 50, 170. Woolard, E., generalized relativity and gravitation, 45, 425.

World Power and Evolution, Huntington, 48, 396.

W., obituary notice, Wright, A.

41, 152, 361. Wyckoff, R. W. G., Crystal structures of carbonates of calcite group, 50, 317.

Wyoming Historical and Geol. Society proceedings, 41, 381.

Х

X-rays, absorption, Aurén, 48, 72; Owen, **47,** 301; Williams, **46,** 766. in aluminum, - analysis, sensibility, de Broglie,

X-ray spectra, de Broglie, 43, 487; Young, C. A., Astronomy, 46, 542; 44, 484.

from certain metals, composi-

tion, Kaye, 44, 334.
— indices of refraction, Einstein, 48, 471.

- penetrating power, Rutherford, 44, 401.

- refraction, Barkla, 41, 560. - relations between spectra of, Ishiwara, 44, 335.

- spectra of iodine and tellurium,

Siegbahn, 41, 465.

- wave lengths, Siegbahn, 43, 167.

Y

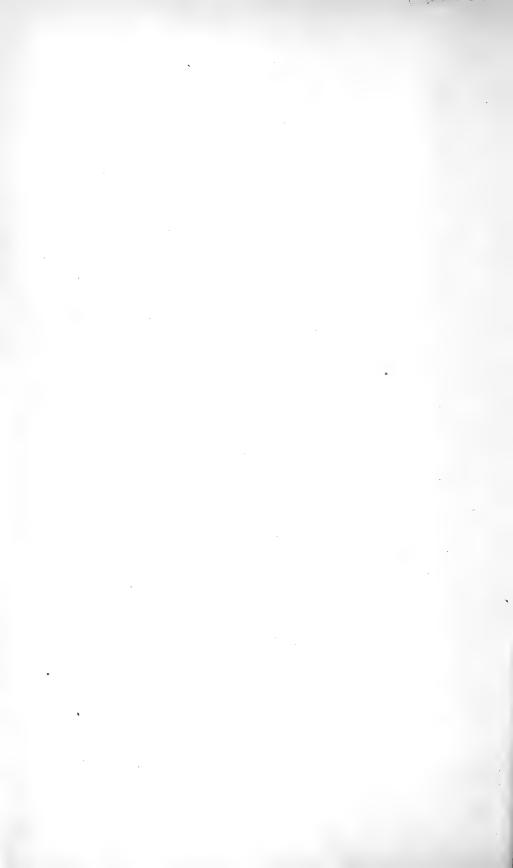
Yerkes, Observatory. See OB-SERVATORY.

47, 386.

Young, S., Stoichiometry, 46, 689.

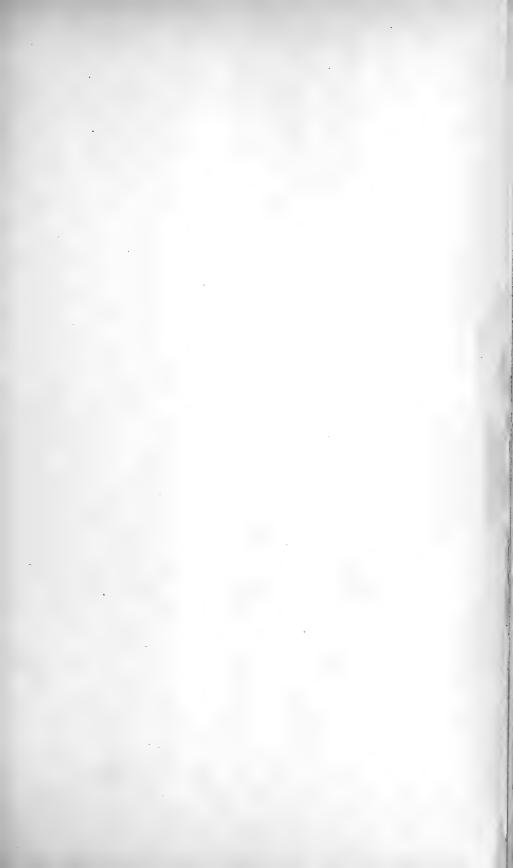
Ziegler, V., Oil Geology, 45, 423. Zinc Industry, Smith, 46, 689. ZOOLOGY.

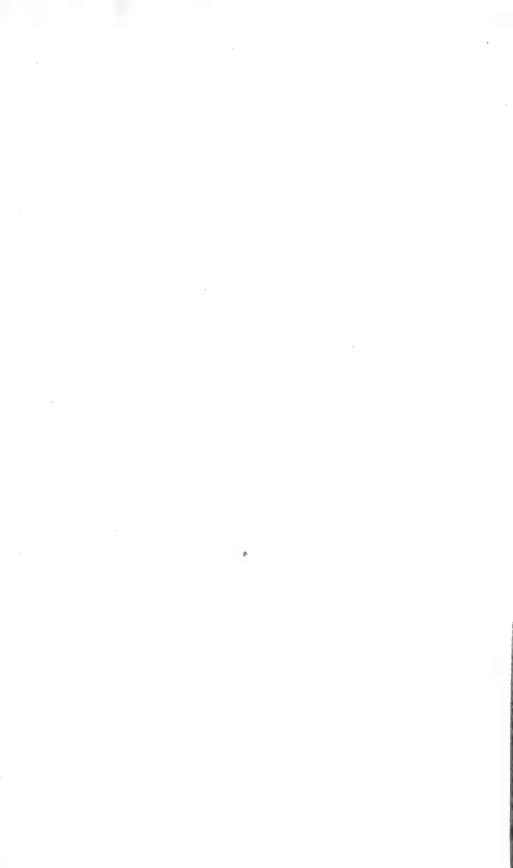
Crinoids, Existing, Clark, 41, 150. Edrioasteroidea, Bather, 41, 302. Zoology, Reese, 47, 452; America, 1818-1918, Coe, 355; Economic, Daugherty, 45, 335; Elementary, Hyman, 49, 84; Invertebrate, Pratt, 41, 84; 150; Practical, Hegner, 41, 150; Vertebrate, Newman, 49, 384. - See Animals, Birds, Insects.



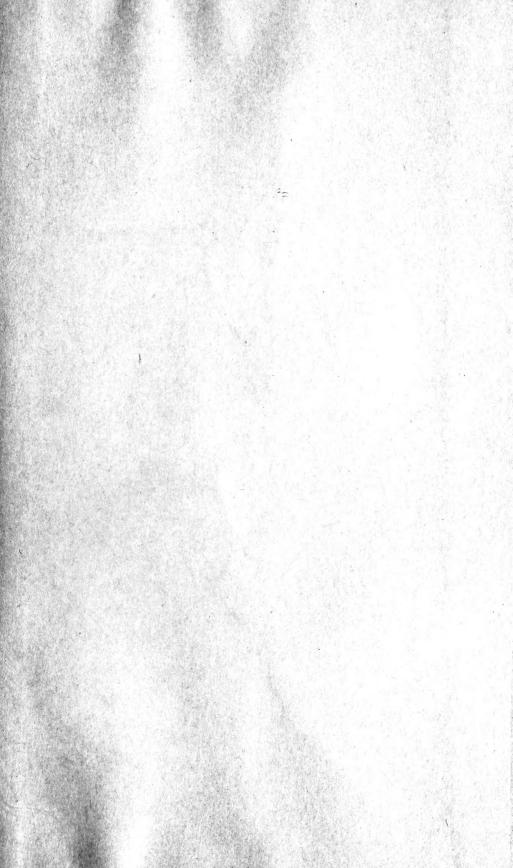
















3 9088 01298 6030